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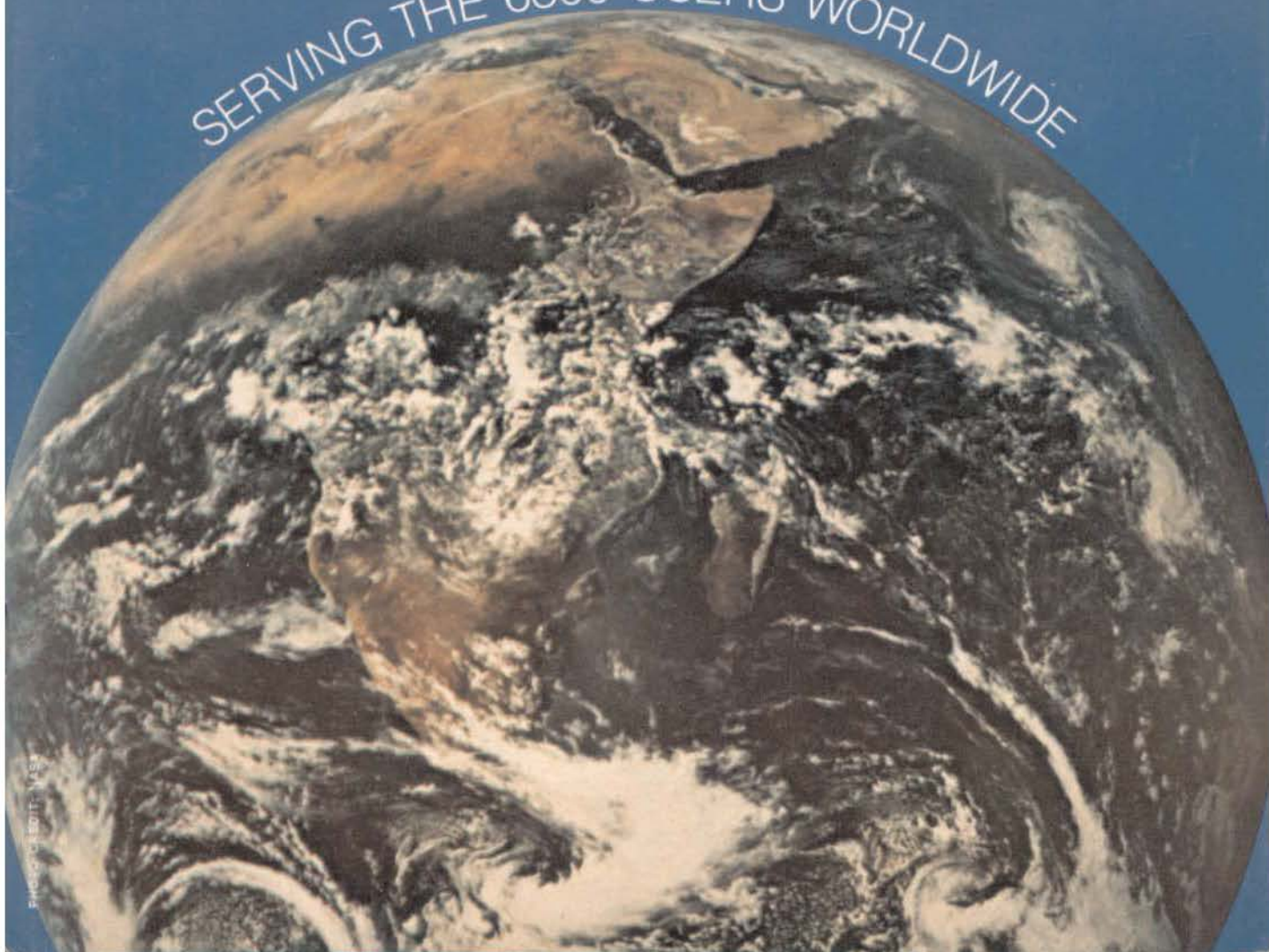
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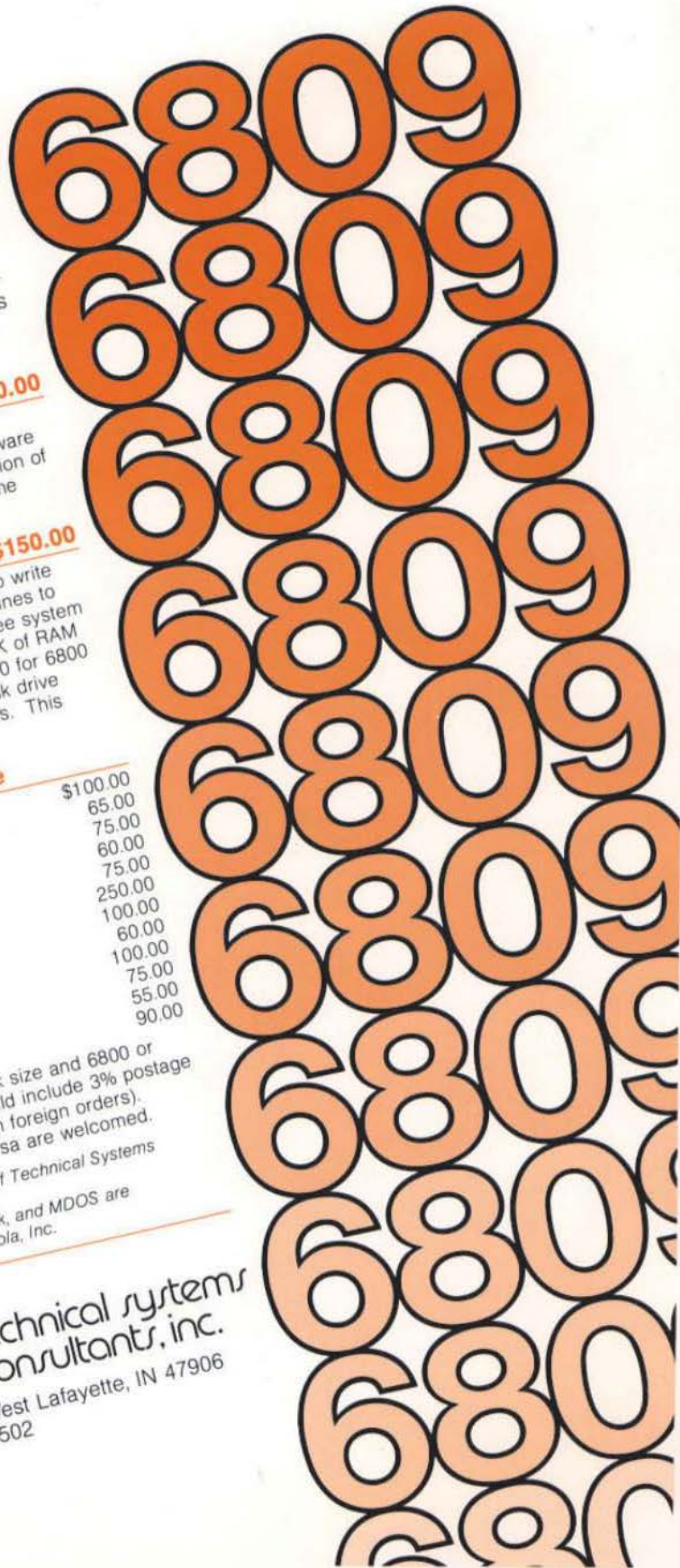
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# MICRO JOURNAL

Portions of text prepared using the following.

SWTPC 6800-6809-DMAF2-CDS1-CT82-Sprint 3  
Southwest Technical Products  
219 W. Rhapsody  
San Antonio, Texas 78216

GIMIX Super Mainframe-Assorted memory boards  
GIMIX Inc.  
1337 West 37th Place  
Chicago, IL 60609

Publisher: Don Williams Sr.

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General Girl 'Friday'  
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Chattanooga, TN 37421

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'68' Micro Journal  
3018 Hamill Rd.  
PO Box 849  
Hixson, Tennessee 37343

— Phone —  
Office: 615-870-1993  
Plant: 615-892-7544  
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'68' Micro Journal is published 12 times a year by '68' Micro Journal, 6131 Airways Blvd., Chattanooga, TN 37421. Second Class postage paid at Chattanooga, TN. Postmaster: Send Form 3579 to '68' Micro Journal, PO Box 849, Hixson, TN 37343.

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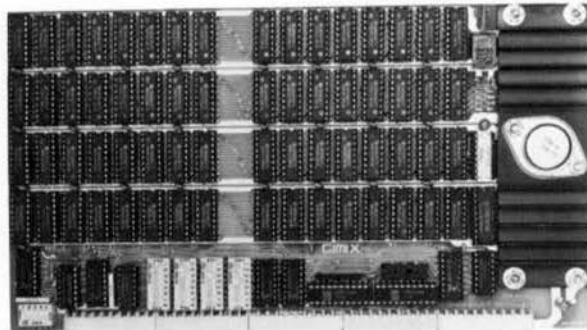


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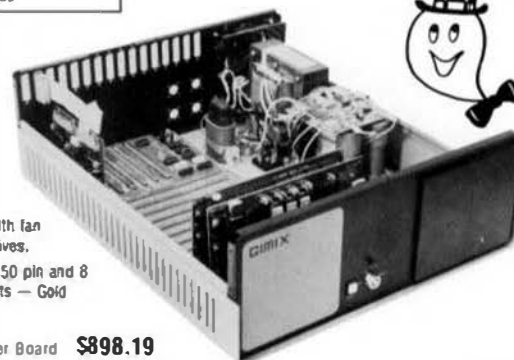
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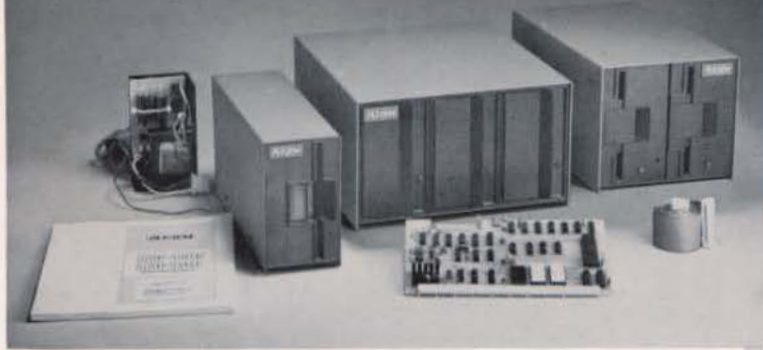
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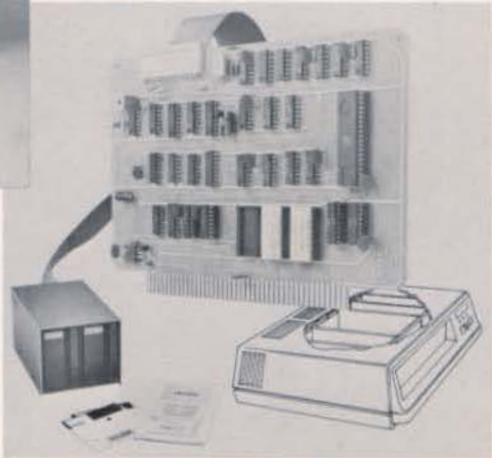
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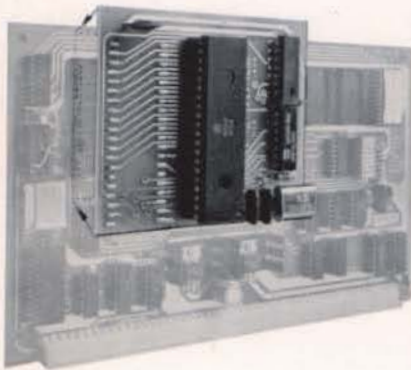
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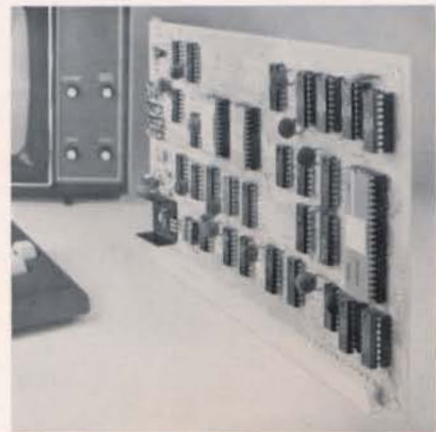
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## COMPUTER SHOWS

During the past few months I have visited two major shows where 6800/09 computers were exhibited. The first was the 1980 Office Automation Conference, held in Atlanta, March 3, 4, 5, 1980.

This is a quality show and one of the most highly touted on the circuit. SWTPC was there for the first time. They were showing their new EDITOR and FORMATTER, as well as the full line of computers, CT-82 video terminal and all the disk systems.

I followed an exhibitor, from a well known large computer and data processing corporation, who had wandered into the SWTPC booth to look over the offerings. He went from there to the 'food concession (?)', where I cornered him with my big, fancy 'press' tag dangling. I asked him a few general questions, then I drifted into what he thought about the last booth (SWTPC) he had visited. His remarks were that it was impressive and that he felt his superiors had better look at whets coming down the pike. Which leads me to this observation, concerning the appearance of SWTPC at this type show; SWTPC was 'outbooted' but there the upmanship ended, they gave an impressive demonstration. I came away feeling good for the S50 bus dealers, the future looks bright, we can compete with the biggies and not look up!

All of the larger computer companies were in attendance and the day that I was there the attendance was down somewhat - so exhibitors were visiting the other booths, to see what was what. I believe there was more money invested in booths, signs and fancy displays than equipment shown.

Also at Atlanta was Cromemco, I was able to confirm that their next projects are two all new systems. Their first will be a 68000 machine and the next a 6809 system. Seems like I was right way back when I told you about the 'other bus and chip' crowd that was coming our way. First Tandy with the TRS-90 or TRS-80C 6809, then Apple with the 6809 Apple III, also Cromemco and just maybe Heath with an H-Niner system and possibly Commodore with a 6809 version of the PET. Rumors are pretty firm on some of the above and others just that, rumors. Oh well, time will tell.

### San Francisco 'Faire'

The San Francisco computer faire was not as well represented by 6800/09 folks (vendor wise) as was last year. Appliance machines were playing their games, much improved over last year, but games still, while some others were selling software from one end of quality to the other. On the whole it was a good show and one that I had not expected to attend after this year, that is before I saw the response that was achieved by the 6800/09 crowd. Maybe next year we will have a much larger S50 bus booth (booths) with all the new stuff we have coming.

As told in another article, in this issue, there were two major points of interest for our folks, at the faire. TSC had a booth that was attended by Dave Shirk and Dan Vanada. They spent a lot of time answering question for curious faire goers and FLEX users. If they could have had Uniflex and the coming C Compiler running, it would have been a blast. Joyce and I know, we held down shop for them during the Purdue basketball playoff game and we were never lonesome at the TSC booth.

At the GIMIX booth, which was actually a general S50 or as Richard Don would have it the FIFTY BUS BOOTH, there was a constant crowd of 68XX users and non-type. It was so crowded at times that the aisles were blocked and people miled around, craning to see some of the new hardware and software running. It could not have been much better for our cause. I saw more than a few S100 (ugh!) users asking about trades on their stuff for 6809 equipment.

Because Arlene and Richard Don covered the GIMIX booth occupants in another article in this issue, I will tell you about some of the other interesting things I saw.

First off I wandered in and out of the chess matches being held between different machines. Micro world champion Sargon 2.5 was doing fairly well the last time I watched it play. Later that evening, Dave Allen (PASCAL) of Control Systems Inc., Joyce and myself were gathered drinking coffee and we roughed out how much faster Sargon would have run on the 6809 rather than a 6502. It might have made a big difference at the chess matches. Oh well, some folks never learn. I am talking to Hayden Books, who hold the rights to Sargon, to let us carry it over to the 6809. If successful will try to make it available on both disk and tape for our readers, at a nominal cost. If interested in this let me know.

Actually Sargon has been rewritten in 6809 language and is running but due to possible complications the programmer has not released a copy for our evaluation. I have it in the Chafitz modular game system and it still gives me a good game in the higher levels, but just takes too long, I play rapid chess. An article on this will be published in the future as it was originally done on a 6800, so I am told. Am attempting to get all the details for an article now.

Also the Exatron Stringy Floppy booth had some interesting items to demonstrate, in addition to their fast load and dump stringy floppy. An operating system quite similar in operation to usual disk I/O systems was demonstrated, by Tom Mattingly, a proud stringy floppy user with his 6800 system. I will not go into any details of the stringy floppy as we are due to receive one for evaluation and review within the next few weeks.

What was interesting was a portable 6809 computer in a not too large attache case, CRT and all. According to Jim Maynard of Exatron it was developed by them for Calif Pacific Insurance Company. It would be carried by agents and other company personnel for on site demonstrations and sales pitches. I understand that Calif Pacific will offer it to dealers for general distribution in the future. If interested you might contact Jim Maynard for any details.

The portable 6809 computer has the following: a 6809 main CPU and a 6802 I/O handler. 48K of RAM and 12K ROM. 4 DMA channels and extended addressing up to 784K. The unit has both color and B/W video output and a Bell type 212 orig/answer modem. The keyboard is commercial grade and is detachable. Also the Intel 8231 math chip is used by the system for rapid math functions. Standard I/O is 2 serial and 2 PIA type. The system is basically supported by their stringy floppy (dual) but handles 2 disk drives as well (external). The base price quoted me was slightly over \$2,000.00. Seems awfully low but then I am not sure of what is all in the base package. Total weight of the basic system is under 35 pounds.

We are supposed to receive one for evaluation and review as soon as the final configuration is



available. The one we saw was a prototype, however; my understanding was that the production units are being done as of this date.

At the Programma booth we saw some good software running on an Apple, again originally developed on a 6800, I understand. Tom Crosley assured me that this software would be soon available for the 68XX users. I feel that there are a lot of good products coming. Seems like I have been saying that for over 4 years now.

All in all we (S50 group) turned some good spade work for the year to come and again I want to thank all you readers, who made the trip, to meet with all of us. It was a big three days and I am now looking forward to San Francisco next year. For all the other bus and chip vendors, Look-out!!!

DMW

## A FAIRE TALE (West Coast Version)

By Arlene and Richard Don

Once upon a time, as all good tales must begin, court was held in the land of the FIFTY BUS at the GIMIX Booth. Mike Magnus and Arlene and Richard Don demonstrated GIMIX' new 6809 CPU boards and systems, as well as their new GMXbug09 monitor which is both terminal and video based.

Terry (Tex) Ritter of Motorola, and Ken and Midge Kaplan, Bob Doggett and Larry Crane of Microware proudly demonstrated their new OS9 and Basic 09 running on a GIMIX 6809 system. Users were allowed to try it, like it, and get their questions answered from the proverbial Horse's Mouth.

Dave Allen of CSI showed his UCSD Pascal on a SWTP. Ed's Note: This is the only full UCSD PASCAL running on the 6809.

In the adjacent booth Mike Lipschutz of the Byte Shop of Hayward, along with Gary Gurule and Randy Moore demonstrated various application packages running on SWTP and GIMIX systems. The local FIFTYIST club members, who meet at the Byte Shop, helped staff both booths. Our thanks to Len Snodgrass, Ron Baxter, Ralph Cavinollo, and Derek Gittelsohn (who also demonstrated his SANbug 6809 monitor).

TSC was well represented at the Faire by Dave Shirk and Dan Vanada, except when Purdue was on TV. During the game (which Purdue won) Don and Joyce Williams staffed their booth.

Tom Crosley, who wrote the Apple PIE word processing system for Programma demonstrated his version for the FIFTY BUS using the GIMIX 80 x 24 Video board. Many of Programma's Apple programs were originally written on the FIFTY BUS. They have promised to start promoting FIFTY BUS software (see their ad for Tom's SPLM) and should now have available their Editor and Word Processing System. Contact them if you're interested.

Bob and Jill Lentz of Microworks and Harold Mauch of Percom were among other hardware manufacturers visiting the GIMIX booth. Ed Smith of the Software Works also was available to answer questions.

Long distance travel honors (excluding foreign visitors) went to Al Clark who came from Tampa. Las Vegas sent Tom Mattingly and Junior Johnson. From Southern California we had Mike Butler and Richard Weiss. Dr. Chuck Adams of Texas made us all look like midgets. Dom DeBroveck (an old friend from

SEMCO in Mich.) who now lives and works in the Silicon valley brought with him a crowd of interested visitors.

Our favorite visitor was an unknown S100 user who with a group of friends spent a good time at the booth looking at and running the various software packages on display. As he left he muttered "Right Software - wrong bus." It won't take him too long to realize that maybe he's on the wrong bus. How long we've waited for the shoe to be on the other foot. GIMIX' main purpose in bringing to the heart of S100 country various FIFTY BUS compatible hardware and Software offerings was to show the wide variety and quality of products that are available. We have a proud future ahead.

A special thanks to Joyce and Don Williams. They were the catalysts in helping make everyone who visited our booth feel like they were attending their own mini convention. They were able to meet and greet many of their readers and writers, and demonstrated their Southern hospitality and good cheer.

EXCLUSIVE!!!! A first look at GIMIX' new 6809 PLUS CPU card. This versatile card is capable of being used with S Bug E, GMXbug 09 and OS9. We were able to get this picture in advance for our readers to see before GIMIX advertises it. We can't wait to get our hands on our own to put to work.

A&RD



Technical Systems Consultants (TSC), Dave Shirk and Dan Vanada explaining all the new good stuff to interested faire goers.



GIMIX booth with GIMIX, SWTPC, equipment, CSI PASCAL, Microware and Motorola OS-9 and BASIC, FLEX and Programma software running.



Another view of the GIMIX booth and Byte Shop of Hayward booth on left.



Left to right; Dr. Chuck 'Grizzley' Adams and Don Williams plotting the coding of a 68000 to emulate a Cray-1.



The GIMIX (assorted Flitty bus vendors) booth, second from right, Dave Allen (UCSD PASCAL), Control Systems, Inc.



Left to right center; seated Joyce Williams (68 Micro), Richard Don (GIMIX), Don Williams (68 Micro), seated Arlene Don (GIMIX).

Photo credits: Mike Magnus

## ED SMITH DIES

It is with deep personal regret and sorrow I inform you of the death of Ed Smith, Ed Smith's Software Works, Redondo Beach, California, who passed away a few weeks back.

Ed was not just an advertiser in 68 Micro Journal but a personal friend. We had carried on a telephone relationship for quite some time and just last March Ed came to San Francisco to meet personally (see article re San Francisco Computer Faire). His death leaves a void that will be difficult to fill in the 68XX micro computing field. Ed Smith was a 'Programmer' of the highest caliber and his continuing excellent contributions to the entire computer community will be sorely missed.

In conversations with his family it appears that his source notes and other material, as well as Ed Smith's Software Works, will soon be available for sale. This would be an excellent opportunity for someone who is proficient in 68XX coding and some business experience.



Left to right; ukn., Ed Smith (Ed Smith's Software Works), Ken Kaplan, Microware and a name unknown but interested faire goer.



In the next few weeks I should have reviewed his technical papers (source code files, notes and assembled listings) and would be willing to offer my opinion of their quality and usefulness, to someone else.

Serious individuals and vendors interested should contact me at the address or telephone number on page 2. If you are on the West Coast you might contact Mrs. Smith, for a personal review of the property.

Due to the inexperience of Mrs. Smith with software and other computer knowledge, the Ed Smith's Software Works is closed, until some arrangement is made.

DMW

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## TSC DIAGNOSTICS

Received in the past few weeks also is a 6809 diagnostics package from Technical Systems Consultants, Inc. Of all the utility packages that TSC has ever offered (and I have practically all 6800/6809) this collection is, in my opinion, the finest they have produced.

Within 24 hours of receiving the package I was able to recover a very important file that had been 'deleted' by accident a few weeks prior. This alone would have justified the price of \$75.00. Also we had a disk develop a 'lost directory' some time back. This was also set aside until I had time to develop a routine to repair this error. This package did it in a few short minutes and all the data recovered. We use four disk systems, 16 hours a day in the operation of Computer Publishing, Inc. and it's several divisions, of which 68 Micro Journal<sup>TM</sup> is one. We have a storage of over 700 disks of various sizes, 8, 5 and winchester, and untold millions of some very important (to us) data characters. These utilities are essential to any operation who depends on disks media for storage. If you cannot 'unstore' the data you are in BIG trouble. These utilities allow recovery of almost any 'gotcha' except major physical damage. Minor damages to disk can still be overcome to the extent that some portions can still be recovered. While not 100% in 'all' cases they are sure a heap better than anything we have had todays.

The package is broken down into sections. The first section is devoted to memory diagnostics. There are six (6) different memory tests. QUICK, which is a zeros and ones test. RANDOM, is a random pattern test. CONVERGE, test for the devices on a memory board that support and address the board, also indicating shorts on memory boards. DYNAMIC, is a test for Dynamic memory and has wait state testing for leaking or slow change bit patterns. Also included is the longer running WALKO and WALKI tests, these are to test memory arrays that are not parallel structured. As all good memory test should do, they report both error and location. For devices using a memory management system of some sort, they report 'logical' addresses. They are all relocatable and may be 'RUN' anywhere in memory, except for those areas in RAM that are used by the monitor for tables, etc. As currently supplied they use I/O in the SWTPC Sbug-E<sup>TM</sup> monitor. A section is included to allow the user to change the I/O pointers for other monitors.

Disk utilities in the package are:

1. TEST, VALIDATE and FILETEST. These check for bad spots and structural flaws of disks.

2. RAWCOPY, is a utility that will copy a file that has a bad CRC (checksum) error. Although the data is probably damaged to some degree, it can most likely be repaired once it is recovered by RAWCOPY.

3. REBUILD and RECOVER are for recovering those files that have been lost due to directory or catalog damage.

4. UNDELETE, is a utility that allows one to recover any 'deleted' file on a disk, it will be intact unless it has been overwritten. Free space from a deleted file is added to the end of the free space directory and so recently deleted files can normally be recovered intact, unless the disk is fairly full and additional files have been placed on the disk after the 'delete'.

5. COPYR, is used to restore the file sector map of a random file after it is recovered by the use of REBUILD.

6. FLAW, removes bad sectors from the free sector chain. This is especially useful for those disks that have intermittent good and bad times, indicating media deterioration, and sometimes missed by 'NEWDISK'.

7. EXAMINE, allows general read/write/modify operation to any sector on a disk. With this utility any byte, in any sector, or series of bytes may be examined and modified as desired.

The documentation is quite extensive. The usual 'how it works' and 'how to do it' information is included. Also a mini tutorial on memory and memory diagnostics is a part of the documentation. The section on disk structure is required reading for the beginner. It is all brought together in the final chapter of the manual, titled 'CASE STUDIES'. These entail detailed explanations and examples on how to fully use the various diagnostics and utilities.

This package is a MUST for all 6809 disk users. A more extensive review will be published at a later date.

DMW

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GOOF

Well we (actually I) did it. If you noticed, and I hope you did because it indicates you are reading the whole magazine, an article in two slightly different forms but the same information, was repeated, first in the April '80 issue and then last month in the May '80 issue.

Just in too much of a hurry to get to San Francisco and to stop off in Phoenix and play a little 'cow pasture pool', with my son who flies fighter jets for Uncle Sam. I constantly dread having any duplicate copies around. But we did and I saw to it that the Star-Kit review was run twice.

We do think that Peter Stark's software (Star-Kits) is good but we were not trying to over do it. Plain and simple I got out of the groove for the first time in over 18 months, and 'Murphy' took over. I apologize to you the readers for this goof, but as you can tell elsewhere in this months issue, the trip to the faire in San Francisco was both enjoyable (meeting hundreds of readers who showed up

to tell us how much they enjoyed 68 Micro Journal and hitting some good licks for the 6800/6809 crowd.

It is now 'official', we will have in print, at a very reasonable price, a new 'programming manual' on the 6809. It is being written by folks who really know the 6809. I mean REALLY know how and why each and every instruction was placed in the chip. It will be the 'bible' of 6809 programming manuals. From one end to the other it will contain examples of proper code utilization for the 6809. The instructions set will be fully covered and lots of hints on how to get the most out of the 6809 will be included. Simple enough for the beginner and yet deep enough for the most experienced programmer! I honestly believe that it will be the FINEST CPU programming manual ever produced for any micro.

As an example of how good I think it will be, already a major publishing house has decided to use our 6809 programmers manual rather than publish their own. They have ordered 3500 already!

I want to thank all of you again for your loyal support, not only to 68 Micro Journal but to our advertisers. We are really reaching a lot of 6800/6809 users (see letter from Thomas Instrumentation (Bit Bucket)), May '80 issue (last month).. When you order something from those who advertise in 68 Micro Journal please, PLEASE, let them know you read 68 Micro Journal. If you are forced to order something from a supplier that is not an advertiser, tell him about your magazine, this helps us all. As it is right now the advertisers really make it possible. If we are to grow we need more advertisers. More advertisers mean more pages and more 6800/6809 articles. We can only increase the size of 68 Micro Journal in 16 page increments. A hard fact is that without advertisers, NO magazine can survive. With our limited distribution (just not as many 68XX machines as some of the others) we are doing much better than we ever expected. But if 68 Micro Journal is to grow and expand both in size and quality, it must have the full support of the entire 68XX community. Today we are ahead of where we expected to be at this time, both in the number of subscribers and advertisers, but we cannot sit on our laurels too long, we must continually strive to increase and improve. Your comments, suggestions and complaints guide our policy. I am never satisfied with the status-quo. So knowing that most of you are not either, if we all work together, you can have a bigger and better magazine.

The 'GIANT SOFTWARE CONTEST' closed the 15th of May 1980. Now the fun begins as we attempt to judge the entries. Some of you will be receiving letters in the next few months requesting that you submit your entry on media (disk or tape) as you have been qualified as a potential winner. If so please respond promptly. I want to have the awards made as soon as we can. However; winner or not I want to personally thank each and every one of you who submitted entries and showed your willingness to share your efforts with the rest of us. As a result of your participation, WE ARE ALL WINNERS!!!!!!

DMW

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**SUPPORT THE ADVERTISERS  
WHO MAKE A 68XX MAGAZINE  
POSSIBLE!!!!!!!!!!!!!!!!!!!!**

## NOTES: BUSINESS PROGRAMS

BY RICHARD G. CAGLE  
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11103 Sagepark Lane  
Houston, TX, 77089  
713-481-3586 (after 6 pm)

This article was written with the first-time business user in mind. It is based on four years of experience - some of it was fun and some was sheer misery! It is hoped that the article will help you avoid the misery and share the fun. If you have a better solution or suggestion, please write. If there is enough interest, we will prepare a sequel. TO FLOPPY OR NOT TO FLOPPY - THAT IS THE QUESTION???

By all means - floppy! Audio cassette systems used in small systems are slow, too subject to human error, and weren't designed to handle storage of data. This does not mean that they cannot be used at all, but I would just as soon go back to chisel and blocks of stone as to go back to cassette. Speed and flexibility are the main advantage of the floppy disk; for example, in my old cassette based payroll program it took twenty minutes to load in basic, load in my program and to load in the tape data records. With floppies the time is reduced to less than a minute. Similar statements can be made for paper tape and punched cards. High speed tape transports are probably useable but are obsolete and not as readily available, which can cause problems in getting repairs.

HOW MANY FLOPPIES ARE ENOUGH???

Two floppies are enough, three is better, and I use 4 - one of which is essentially an on-line spare. A single floppy is better than cassette, but it is not as easy to make backups with a single drive, and making backups is an essential part of any business computer use.

If you can afford it, buy dual full size drives. Their higher capacity will enable you to cram more data and programs onto a diskette. The diskettes cost only slightly more than mini-diskettes, but their capacity may mean that you can get by with fewer disks for archive. (I will talk more about archive and backup later.) If your business is a service business (no inventory) and is grossing less than \$100,000 per year, you can probably do all right with mini-floppy drives. Keep in mind future expansion of your business, which may drive you to go ahead and cough up the bucks for full floppies.

REMEMBER THE MEMORY!!!

Several articles have been written on how to scientifically determine the amount of memory that you need. Typically, the small business user does not fully understand how he will use his machine, much less how usage will equate to memory size. I have developed a simple rule, based on experience: BUY AS MUCH MEMORY AS YOU CAN AFFORD, THEN BUY SOME MORE UNTILL THE MACHINE CAN'T HOLD ANYMORE. 6809 users may want to modify this rule slightly. For 6800 you should end up with 32-40 K. Should you attempt to get by with less memory than this, you will find that you will always be 'shoehorning' your programs into the available space, running out of memory in the middle of important programs, and your programs will not be useable by an unskilled operator. One item that uses memory is the use of words in either program or data. You can write programs without words, but using them liberally has advantages: debugging is easier where words can be used to find where the program went astray, your faithful employee will prefer to be called "Mary" on her pay and not "1101", and a well written business program will use words to prompt the operator through the steps.

WHO NEEDS A PRINTER???

You do! A printer is a necessity, not a



luxury. It is convenient to have a printer to spit out listings of programs. A printed list is easier to read thru and grasp the program flow than the limited 16 lines on the CRT. It is also nice to backup your data files with a hard copy in case disaster strikes and your prime and backup disks get crashed. Finally, the hard copy is essential for keeping records that the IRS may want to look at during an audit.

However, it is not essential that your printer be fancy. It is easy to spend a lot of bucks on a letter quality printer. You don't really need it. A 40 column printer such as the PR-40 is adequate. The primary user of the printer data is you! As long as it is readable to you, and cheap to operate and maintain, then that is good enough!

If you intend to do a lot of word-processing on your machine, then a printer with fully formed characters may be justifiable. Keep in mind that a simpler dot matrix printer can provide very good print quality for a lot less money, and the dot matrix printers are generally considered to be more reliable than the daisy-wheel or selectric types. I would recommend avoiding printers that have to have expensive special papers due to cost and availability of paper.

YOU CAN USE AN OLD TV FOR YOUR CRT MONITOR - CAN'T YOU???

Yes and you can eat chow-meln with chopsticks, too! The two main disadvantages are: the resolution is too poor and the line length is restricted. The bandwidth of commercial TV sets is only about 70% that of a good video monitor, therefore, in order to be useable, the line length must be reduced to about 32 characters. Even then the characters will not be crisp and readable - not suitable for viewing for long periods of time. The short line length prevents you from dumping large quantities of data on the screen for review at the same time. Your terminal/monitor should have at least a 60 char/line, 16 line/page, have at least 300 and 1200 baud rate, and control character selectable page or scroll mode. Color graphics are great for games but are not needed for business use.

Now that we have defined the system we need,  
IS IT BETTER TO BUILD KITS???

Ask someone who went the kit route - like me. I would recommend against it, but given the opportunity to do it again I would probably go the kit route. That doesn't sound like a straight answer, does it?

If you have experience in building complex kits, enjoy it, want to know all about how the hardware works, have time and fingers to burn, then build kits. If you are impatient, want it to work the first time, are more interested in software than hardware, or have a buddy who can do your repairs for you, then you should buy assembled units. Aside from the personality requirements, there is seldom a major cost difference between a kit and an assembled unit. It costs the manufacturer almost as much to stuff parts into boxes as it does to stuff them into printed circuit boards. Your reputable manufacturers will typically thoroughly test assembled units before shipment, and many will keep them operating long enough to uncover any 'infant mortality' failures. You will have to do your own testing if you build a kit, and more than likely it will not work after assembly. Not because of any falling on the part of the kit supplier, but because you got into a hurry and blew the solder job! More than likely the soldering skill required is much more than you think! Most of the kits that I have seen (SWTPC) have instructions that are adequate for an informed kit-builder. They are not to the same level of detail as Heathkit provides. Some articles have recommended using sockets for all IC's. It is just as likely that a socket will fail as the IC, complicating the

troubleshooting. I particularly had problems with IC leads bending under the body during insertion, which was hard to spot in the high wall socket types. I also had more problems with the name-brand expensive sockets than with the cheapies. I recommend using sockets only on those IC's that are expensive (over 4.00), and all others should be soldered in. To remove a failed or suspect IC, cut it off with diagonal cutters and throw it away - do not try to unsolder it to save it, or you may damage the printed circuit. Unsolder the leads one at a time and remove with tweezers. Follow the instructions for MOS IC handling - it is a nuisance, but it can save you \$\$\$\$. Your manufacturer may be hesitant to replace for free a damaged MOS IC because the most likely cause of failure is static electricity discharge (commonly called 'ZAP'). Troubleshooting help is almost zip - a schematic or logic diagram and a theory of operation is about it. Troubleshooting a digital system is very difficult without a scope. With a scope you can probe around and look for any IC lead that does not have a relatively clean waveform or does not have 5 volt and 0 volt states. I.E. If you see 1.5 to 4.0 volts, something is probably wrong.

BEAUTIFULL, BEAUTIFULL BROWNOUTS.  
BEAUTIFULL, BEAUTIFULL BROWNOUTS.  
BEAUTIFULL, BEAUTIFULL BROWNOUTS.  
I'LL NEVER LOVE BROWNOUTS AGAIN!

One of the shortcomings of all small systems is that they are vulnerable to power brownouts or outages. Never plug your system into a power circuit that also has kitchen appliances, power equipment, or motorized equipment. These circuits normally see fairly hefty transients. For a CT-64/6800 system, a momentary shrinkage of the CRT screen concurrent with refrigerator (or hair dryer, etc) startup is a dead giveaway that your circuit isn't good enough. Transients can cause unpredictable results as the system is going down, and false data can be written to disk, or a few memory locations can be altered. Minimize the time that you are exposed by keeping disk drive doors open as much of the time as possible, always have a backup copy that is safe on the shelf. Don't invite problems by running your system during storms.

Relatively expensive devices are available, such as battery power systems and uninterruptable power supplies, if your power utility can't be trusted. However, total reliability is never achieved so you should:

PLAN AHEAD! OR AS THEY SAY AT OICKEN LITTLE NURSERY SCHOOL: "THE SKY IS FALLING, THE SKY IS..."

Remember Apollo 13 - that was the mission that was a near disaster. An old, old disaster recovery plan that had been dreamed up years before was dusted off, and with a little bit of real time heroics, the crew was returned safely. Your business may not hit the news when the old computer bellies up, but if you didn't plan ahead, it could be a life-and-death situation. Here is some free advice:

Put some 'fat' in your schedules. Don't promise to deliver paychecks until at least 3 days after the payperiod has ended. Most big outfits lag by about a week, you can lag by a few days without any squawk from your employees.

Know how to do all of your payroll operations manually. Have a copy of IRS circular 'E' and know how to use it. Have manual methods of doing all of the functions that your computer does, just in case. One of the best ways to check out a computer program is to operate it in parallel with a known good manual system for several months, periodically crosschecking results.

Programs should be written with disaster avoidance/recovery in mind. For example:

Minimize open files (and closed drive doors)

during the time consuming portions of your program. Close unused files, even if you have to open them again later to use them.

Provide some means of checking the program results before files are cast in concrete. Dump results on the CRT or Printer and check them.

If sequential files must be written as you go, use scratch (.SCR extension) file names and don't rename them as data (.DAT) files until results have been checked.

Where possible, provide two different means of calculating totals and have the program compare the two, stopping on mismatches. Make reasonable tests on data coming in from the disk and especially from the terminal. Check for negative numbers, strings instead of numbers and vice versa, amounts above or below reasonable limits (like dates before 1970 or after 2000).

Keep adequate backups. To me adequate backups means 4 things; (1) a copy of all active files is made once each week on a separate disk. I use the back side of my payroll disk to write my general ledger backup and vice versa. (2) once each month a separate disk (new) is used to make a copy of all data files and this copy goes on the shelf in a box labeled 'Active Backups'. These backups are kept until well after all possible use is past - about 6 months after the year end. (3) a hard copy of new data generated during a program run is kept. (4) at least 2 copies of all programs, utilities, operating system, basic, etc is kept on the shelf. Hardcopy of program listings are also kept - either the current version, or a recent version with markups to reflect the changes.

In addition to the above, I keep an archive, which consists of one prime copy and one backup copy of every data file at the beginning of the year, and another at the end of the year. These are kept indefinitely along with file dumps of all files at the year end and beginning. (Note, file dumps using your list utility may not be possible with some of the random access Basics such as TSC's extended basic. You may have to write a basic program to do the dump.)

#### ONLY AN IDIOT WOULD PROGRAM IN BASIC!!!

Basic has many disadvantages as compared to assembly language. It is slower, takes up too much memory space, and you are limited to the functions/statements/commands that the Basic has. All of us Idiots understand the disadvantage of Basic, but go ahead using it.

The main reason I continue to use Basic is that it is easy to use. Not only during initial programming, but also much, much easier to debug and a million times easier to revise. Assembly language programs can be greek if you haven't worked with them for a year or so. The built-in error checking of Basic is worth its weight in gold when debugging. SINCE BASIC IS SO EASY, ANYBODY OUGHT TO BE ABLE TO PROGRAM THEIR OWN BUSINESS PROGRAMS!!!

Wrong again! The basic problem is not basically Basic, but believe me, baby, the basic, basic bugaboo is the bloody logic. Just because you can speak English does not mean you can orate like Churchill or write like Hemingway!

If at all possible, buy your business programs, instead of trying to program them yourself. The effort required to build a program from scratch is terrible! Since I haven't purchased any business software, I am not really qualified to give advice but I'll give some anyway: (1) Make sure the software will run on your machine, i.e. it uses the same DOS, peripherals, etc. (2) Buy only software that is sold with listings. Or is in a non-compiled form of basic that can be listed. (3) As soon as you get it, run it in all modes and decide if it is useable to your particular business needs. If not useable, send it back with a detail description of why it

isn't suitable. (Do not keep a copy - that is cheating!) Most reputable software peddlers understand that the needs of all businesses will not be met with their package and will refund your money.

It is highly unlikely that you will be able to get a program or set of programs that will precisely fit your business needs. That's why it is important to get a listing that you can use to understand and modify the program to meet your own needs. In addition, your needs will be changing as your business grows or whenever Uncle Sam changes the rules.

Notice in the above discussion that I never mentioned the possibility of having a programmer prepare you a set of programs - don't do it, it is just too expensive.

Assuming that you have purchased a set of programs that almost fits your business, there are three ways to finish up the job. (1) Have a programmer do it for you. (2) Program the changes yourself. (3) Bend - change your business requirements to match up with the software.

I would recommend that you perform the changes yourself. It will give you a deeper understanding of the programs and will enhance their value to you.

It has only been recently that several software vendors have offered relatively inexpensive business software for the 680X businessman, as can be seen in the ads in this journal. At the time I started there were none available. My current programs pretty well meet my needs, and were built over the years by constant modification and addition. I am currently in the process of upgrading to Flex 2.0 and TSC's Extended Basic, not because I have too, but because I am hooked on the habit!

Ed's Note: We are attempting to answer the request for business type applications, you the readers have asked for. This article is referenced to the 'business software' sold by APPLEVALLEY DAY SCHOOL, INC. and advertised as a card size ad for the last three months. Let me know your feelings and desires on this type article.

DMW

NOTE: due to the length of the following it will be continued for a couple of months, as space permits. I and the staff of 68 Micro Journal wish to thank Dan Meyer of SWTPC for his approval to run this copyrighted SWTPC software. Also a big thanks to Allen Clark and Wallace Watson for the many hours (days) spent decoding and commenting the monitor. To be continued:

Note: All occurrences of 'Q' should be indicated as '\'. The 15 pitch daisy wheel we use has no 'backslash' but prints a 'Q' instead.

```

1      NAME  "SBOODS.DAT"
2
3      * THIS PROGRAM IS A PORTION OF THE "SBOODS" MONITOR THAT
4      * PERFORMS THE DYNAMIC ADDRESS TRANSLATION (DAT).
5
6      * BY: ALLEN CLARK
7      * 2500 MICAL OAKS LANE
8      * LUTZ, FLA. 33549
9      * FEB. 26, 1980
10
11     * POWER UP/ RESET/ NEW ENTRY POINT
12
13
14     55AA  ESTAB  EQU  55AA  SEARCH INITIALIZATION ADDRESS
15     0FDD  STAB  EQU  0FDD  DAT FROM CHIP
16     1C11  IC11  EQU  1C11  DAT FROM CHIP
17     1C11  IC11  EQU  1C11  DAT FROM CHIP
18     1C11  IC11  EQU  1C11  DAT FROM CHIP
19     1C11  IC11  EQU  1C11  DAT FROM CHIP
20     1C11  IC11  EQU  1C11  DAT FROM CHIP
21     1C11  IC11  EQU  1C11  DAT FROM CHIP
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'88' Micro Journal



'68' Micro Journal

### '68' Micro Journal

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772 FC73 A6 14 STORE SAB ADDR ON STACK
773 FC75 B6 12 LOAD WORD: PUNCH OR CODE
774 FC77 17 0100 OUTPUT IT TO TERMINAL
775 FC7A 07 04 PUNCH2 LOAD END ADDR IN A-ACC
776 FC7C 1 62 SUBTRACT BEGIN FROM END
777 FC7E 27 00 RED SAME, PUNCH 32 BYTES DEFALAT
778 FC80 0B03 0000 CHPU 4320 LESS THAN 32 BYTES?
779 FC84 23 00 PUNCH4 BLS PUNCH4 PUNCH THAT MANY BYTES
780 FC86 C8 00 PUNCH5 LDB 4320 LOAD BYTE COUNT OF 32
781 FC88 E7 04 PUNCH6 STB 0,5 STORE ON STACK AS BYTE COUNT
782 FC8A BE 170C LDR 045G20 POINT TO REG 514
783 FC8C 17 0100 PRINT REG
784 FC8E C8 03 ADDCH 43 ADD 3 BYTES TO BYTE COUNT
785 FC90 11 96 LDR 1/4 GET BYTE COUNT IN A-ACC TO PUNCH
786 FC92 11 96 LDR 1/4 GET BYTE COUNT IN A-ACC TO PUNCH
787 FC94 11 62 LDR 3,9 LOAD BEGIN ADDRESS
788 FC96 17 000F BSA OUT141 PUNCH ADDRESS
789 FC98 E8 02 ADDCH 3,1 ADD ADDR LDB TO CHECKSUM
790 FC9A E8 04 ADDCH 4,1 ADD DATA BYTE TO CHECKSUM
791 FC9C E8 06 ADDCH 6,1 ADD DATA BYTE TO CHECKSUM
792 FC9E 46 00 LDR 1/4 LOAD DATA BYTE TO PUNCH
793 FC9F 17 0000 LDR 1/4 OUTPUT DATA BYTE
794 FC9F 04 04 DEC 4,5 DECREMENT BYTE COUNT
795 FC9F 26 75 BAZ PUNCH4 GET IT IN A-ACC TO PUNCH
796 FC9F 33 0000 CORB GET IT IN A-ACC TO PUNCH
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* IS OADR BY SUBSTITUTED ASCII
* LETTERS FOR THE ONES IN THE BYTE.
* THE ASCII ENHANCEMENT LETTERS
* ARE OBTAINED FROM THE STRING
* POINTED TO BY THE INCR REG. XXX.
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1093 FES2 F3 FDB *1
1094 FES3 F3 FDB *1
1095 FES4 F3 FDB *1
1096 FES5 F3 FDB *1
1097 FES6 F3 FDB *1
1098 FES7 F3 FDB *1
1099 FES8 F3 FDB *1
1100 FES9 F3 FDB *1
1101 FES10 F3 FDB *1
1102 FES11 F3 FDB *1
1103 FES12 F3 FDB *1
1104 FES13 F3 FDB *1
1105 FES14 F3 FDB *1
1106 FES15 F3 FDB *1
1107 FES16 F3 FDB *1
1108 FES17 F3 FDB *1
1109 FES18 F3 FDB *1
1110 FES19 F3 FDB *1
1111 FES20 F3 FDB *1
1112 FES21 F3 FDB *1
1113 FES22 F3 FDB *1
1114 FES23 F3 FDB *1
1115 FES24 F3 FDB *1
1116 FES25 F3 FDB *1
1117 FES26 F3 FDB *1
1118 FES27 F3 FDB *1
1119 FES28 F3 FDB *1
1120 FES29 F3 FDB *1
1121 FES30 F3 FDB *1
1122 FES31 F3 FDB *1
1123 FES32 F3 FDB *1
1124 FES33 F3 FDB *1
1125 FES34 F3 FDB *1
1126 FES35 F3 FDB *1
1127 FES36 F3 FDB *1
1128 FES37 F3 FDB *1
1129 FES38 F3 FDB *1
1130 FES39 F3 FDB *1
1131 FES40 F3 FDB *1
1132 FES41 F3 FDB *1
1133 FES42 F3 FDB *1
1134 FES43 F3 FDB *1
1135 FES44 F3 FDB *1
1136 FES45 F3 FDB *1
1137 FES46 F3 FDB *1
1138 FES47 F3 FDB *1
1139 FES48 F3 FDB *1
1140 FES49 F3 FDB *1
1141 FES50 F3 FDB *1
1142 FES51 F3 FDB *1
1143 FES52 F3 FDB *1
1144 FES53 F3 FDB *1
1145 FES54 F3 FDB *1
1146 FES55 F3 FDB *1
1147 FES56 F3 FDB *1
1148 FES57 F3 FDB *1
1149 FES58 F3 FDB *1
1150 FES59 F3 FDB *1
1151 FES60 F3 FDB *1
1152 FES61 F3 FDB *1
1153 FES62 F3 FDB *1
1154 FES63 F3 FDB *1
1155 FES64 F3 FDB *1
1156 FES65 F3 FDB *1
1157 FES66 F3 FDB *1
1158 FES67 F3 FDB *1
1159 FES68 F3 FDB *1
1160 FES69 F3 FDB *1
1161 FES70 F3 FDB *1
1162 FES71 F3 FDB *1
1163 FES72 F3 FDB *1
1164 FES73 F3 FDB *1
1165 FES74 F3 FDB *1
1166 FES75 F3 FDB *1
1167 FES76 F3 FDB *1
1168 FES77 F3 FDB *1
1169 FES78 F3 FDB *1
1170 FES79 F3 FDB *1
1171 FES80 F3 FDB *1
1172 FES81 F3 FDB *1
1173 FES82 F3 FDB *1
1174 FES83 F3 FDB *1
1175 FES84 F3 FDB *1
1176 FES85 F3 FDB *1
1177 FES86 F3 FDB *1
1178 FES87 F3 FDB *1
1179 FES88 F3 FDB *1
1180 FES89 F3 FDB *1
1181 FES90 F3 FDB *1
1182 FES91 F3 FDB *1
1183 FES92 F3 FDB *1
1184 FES93 F3 FDB *1
1185 FES94 F3 FDB *1
1186 FES95 F3 FDB *1
1187 FES96 F3 FDB *1
1188 FES97 F3 FDB *1
1189 FES98 F3 FDB *1
1190 FES99 F3 FDB *1
1191 FES100 F3 FDB *1
1192 FES101 F3 FDB *1
1193 FES102 F3 FDB *1
1194 FES103 F3 FDB *1
1195 FES104 F3 FDB *1
1196 FES105 F3 FDB *1
1197 FES106 F3 FDB *1
1198 FES107 F3 FDB *1
1199 FES108 F3 FDB *1
1200 FES109 F3 FDB *1
1201 FES110 F3 FDB *1
1202 FES111 F3 FDB *1
1203 FES112 F3 FDB *1
1204 FES113 F3 FDB *1
1205 FES114 F3 FDB *1
1206 FES115 F3 FDB *1
1207 FES116 F3 FDB *1
1208 FES117 F3 FDB *1
1209 FES118 F3 FDB *1
1210 FES119 F3 FDB *1
1211 FES120 F3 FDB *1
1212 FES121 F3 FDB *1
1213 FES122 F3 FDB *1
1214 FES123 F3 FDB *1
1215 FES124 F3 FDB *1
1216 FES125 F3 FDB *1
1217 FES126 F3 FDB *1
1218 FES127 F3 FDB *1
1219 FES128 F3 FDB *1
1220 FES129 F3 FDB *1
1221 FES130 F3 FDB *1
1222 FES131 F3 FDB *1
1223 FES132 F3 FDB *1
1224 FES133 F3 FDB *1

```

\* THE FOLLOWING CODE STORES THE COMPLEMENT OF  
 \* THE CHARACTER OF THE FOUR CHARACTER HEX  
 \* ADDRESS OF THE FIRST BLOCK OF RAM LOCATED  
 \* BY THE EQUINE SYSTEM INTO THE DATA RAM. IT  
 \* IS STORED IN RAM IN THE LOCATION THAT IS  
 \* ADDRESS 0000 WHEN THE PROCESSOR ADDRESS IS 0000.  
 \* THIS IS THE FIRST BLOCK OF RAM IS FOUND  
 \* AND TESTING LOCATION 0000, MEANS THERE  
 \* IS NO RAM PHYSICALLY ADDRESSABLE IN THE RANGE  
 \* 0000-0000. THEN THE COMPLEMENT OF  
 \* 0000-0000 WILL BE STORED IN  
 \* THE DATA RAM, THIS WHEN THE PROCESSOR OUTPUTS  
 \* AN ADDRESS OF 0000, THE DATA RAM WILL BE  
 \* BY RECOMPLEMENTING THE ADDRESS AND OUTPUTTING  
 \* 7 ONTO THE ADDRESS LINE. THIS THE  
 \* RAM THAT IS PHYSICALLY ADDRESSABLE AT 0000.  
 \* WILL BE REVERSE AND ADDRESS TO THE ADDRESS 11  
 \* IS AT 0000. SINCE THIS IS THE ADDRESS THE  
 \* 0000 WILL BE OUTPUTTING WHEN THE BLOCK  
 \* OF RAM RESPONDS.

## FLEX USER NOTES

BY RONALD W. ANDERSON  
3540 STURBRIDGE COURT  
ANN ARBOR, MI 48105

### NEW VEHICLE OF COMMUNICATION

For all of you who have been members of the FLEX user's group, this is a new format for our Newsletter. For those of you who have not heard of us, this is a new column for the '68' Micro Journal. A year or so ago, I started this venture and now have 65 or so subscribers. At the same time Don Williams started '68' Micro Journal. A couple of months ago, I wrote Don, indicating that '68' was doing a better job of what I wanted to do than I was. Don offered to take over my subscription list and send '68' to the subscribers for the remainder of their subscriptions to my newsletter, and I will in turn supply the newsletter as a column for '68' Micro Journal. This way, I only have to write the material, and it reaches a vastly larger audience.

Those of you who have been in on this since the beginning know that I have solicited programs, hints, reports, etc., on FLEX related software and SS-50 bus related hardware. There are even a few brave souls out there who have made their own "homebrew" systems and managed to be FLEX compatible. This idea brings up a point that I would like to make here. FLEX is copyrighted by Technical Systems Consultants of West Lafayette, Indiana. They are very defensive of their copyright. I am not a lawyer nor am I expert in the area of patent or copyright laws, but I believe TSC has every right to defend their copyright and prosecute violators vigorously. Any of you who program professionally, realize that programmers are paid by their employers. I don't, of course have the figures from TSC, but I personally was involved in the writing of an assembler program for a machine control (less than 8K long). My best estimate as to the cost of this program to my employer is \$10,000 to \$12,000. TSC has been very kind to us in their pricing structure. In order to stay in business, they must recover the cost of their software and hopefully show enough profit to satisfy their

investors and allow expansion of their efforts into bigger and better products as their customers get more sophisticated and equipment becomes more capable.

The point of all this is that some of us have disassembled FLEX. I personally have a good copy of Miniflex in source listing form that assembles perfectly to yield a working copy of FLEX.SYS. I could reason that since someone else has purchased FLEX, I could share this with them. TSC does not like this reasoning at all. The only "fair" way for anyone to obtain a copy of the source of FLEX is to buy a copy and disassemble it for himself. I recently received a letter from a professional programmer who is building a homebrew system, and in need of a source listing, wanting to know if I could help in the area of the disk drivers. My advice was to buy a copy of FLEX and disassemble it. This person indicated the availability of a friend with a working FLEX system. I have discussed the situation with TSC and I will not part with a copy of my source listing, though TSC agrees that I may use knowledge gained by having the listing to write FLEX utilities and overlays to their utilities.

Enough of the lecture, though I felt this needed to be said at the outset.

### THE 6809 AND ITS INSTRUCTIONS

I have recently gotten a 6809 board from SWTPC up and running. I have an older SWTPC system with the old MP-B Mother Board. A look at the modifications necessary to readdress the I/O to \$e000 from its old location at \$8000, indicated that the addition of a single pole double throw switch would allow address selection switching so that the 6800 and the 6809 boards could be run by changing processor boards and flipping one switch. See figure 1 for the necessary switch location. I have been running in this mode for several weeks now with no problems. The reset button need not be disconnected as indicated in the instructions, and a reset button of sorts may be connected separately to the '09 board, either left "dangling" on wires or attached to the front panel.

It was of interest to me to see that there are several instructions in the 6800 instruction set that are not supported by the 6809, yet the TSC assembler will assemble an old 6800 source listing. It does this by assembling a combination of 6809 instructions that simulate the 6800 instruction. Figure 2 is a listing of a test program that indicates what the '09 assembler assembled, and what the '09 instructions actually are. It was of great interest to me to disassemble these instructions by hand, as I learned that it is possible to simulate any number of INX or DEX instructions (also for incrementing the Y and U registers), by means of an instruction in the indexed mode using the "load effective address" instruction series. For example to increment X by 4, you use LEAX 4,X . This simply loads X with the present contents of X plus 4. Since the '09 allows both positive and negative offsets, you can also use LEAX -4,X to replace four DEX instructions. The figure will show several other equivalent instructions. I have a floating point math package that I wrote from scratch, that is about 1.5K long. Assembling it in the '09 made it grow slightly because of the substitute instructions being more bytes. Optimizing it for the '09 (which I have not finished) has so far saved over 256 bytes or nearly 17%.

It is of course possible to write a program to be position independent. This means that it may be loaded anywhere in memory, and it will run at that location. This is extremely useful for some utilities such as a Dump or Save utility, or perhaps a Disassembler program. This allows the utility to operate on another program anywhere in memory without having two or more versions of the utility. If my subscribers will bear with us, I think this idea is important enough to include a couple of programs that were in the last newsletter. These are a program called LOGO that loads a program with the extension .PIC for position independent code, and then jumps to the first load address. The position independent program must be ORG'ed at \$0000, and a load address is specified with the LOGO command as indicated in the listing. The program must allow entry at its first byte by means of a branch to the start of the program if it is somewhere else in the

program. There are two position independent programs included here, one called DUMP which is a Hex ASCII dump program, and one called MEMOVE which moves a block of data from one memory location to another.

## 6800 STUFF

I have recently received Lucidata's update to their Pascal. You may remember that the original version had some limitations as reported in a past issue of '68' Micro Journal. The update includes RECORDS several other features, and best of all, Real Variables, which means floating point arithmetic. Lucidata has not adhered blindly to the USCD standard, which may infuriate Pascal purists. However pure Pascal has no way to access, for example, a parallel I/O port and read or write data to it. This is fine for Pascal as a computer science tool in learning programming. In the real world where applications include such things as machine controls, and the processor must interface with transducers, and in general anything other than a terminal and a printer, it is necessary to be able somehow to access the absolute addresses of the ports involved. Lucidata has included PEEK and POKE as well as labels and a GOTO statement. Nearly all of the writers who have written texts on Pascal have indicated that the GOTO used in the right place, improves the structure of a program. The catch is that if it is available, it is abused rather than used properly.

Actually, Lucidata has made a very good offer to those who purchased the original version. They have offered to supply the update in the customer's choice of 6800 or 6809 version. Externally there should be no difference whatever in the two versions. You might wonder if scientific functions are supported. Only ABS and SQR (square) are supported. I have here supplied listings of procedures for the trigonometric functions and the exponential and logarithm. I had written most of them in Assembler, to some limited accuracy, and a routine or procedure as they are called in Pascal for each was not too difficult to write. It would be nice if Pascal were to implement a library function, to



include procedures that are written as separate files on a disk, but they have not done this. We with FLEX may of course append files to build a program, so it still is fairly easy to include standard procedures.

If some one of you is using this Pascal for manipulation of data files etc., I would appreciate a report to pass on to our readers. I tend to use programs to solve Engineering problems, and am therefore more interested in such things as Scientific functions than Records and Data files.

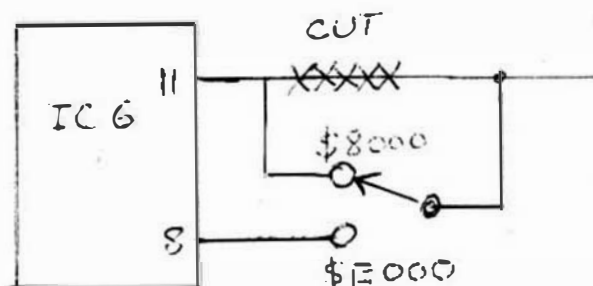
I should point out at this point that the Manual included with this Pascal is not as complete as the one sent with the preliminary Pascal. The author assumes that the user has considerable knowledge of Pascal to start from. If you are ordering this version, I would suggest getting one of the many Pascal books now available, and studying it carefully. These remarks are not meant to be critical of the manual. Pascal is a well documented language and its use is explained very well in several available books. Just look in any of the Computing Magazines for ads and you will see several. If Lucidata were to make a "tutorial text" out of their manual, it would have to be much larger, and would increase their costs considerably. Since many more people will buy a book on Pascal, than will buy this particular version of a Pascal compiler, their costs would have to be passed on to us as at a much higher percentage of the total cost for each copy that they would sell. It is to our mutual advantage to be able to buy a low cost and complete book on Pascal to learn Pascal programming, and get a manual that concentrates on the deviations of this version from "standard", and also includes a good bit of information about such things as memory allocation, interface with user Assembler routines, hardware interface, and custom modification of the compiler for your system. Once you have an understanding of Pascal you will find that the syntax diagrams included in the manual are all you need to figure out the structure of any statement you need for a program.

The Lucidata manual contains a list of recommended readings. I would add a very good book I found in the

local "dalton Booksellers" store. it is called A Primer On Pascal by Conway, Gries, and Zimmerman, published by Winthrop Publishers, Inc. Cambridge, Mass. It goes well beyond this implementation of Pascal, but has some extremely good chapters on testing your program, and "the meaning of correctness". You will find that when your program gets to the state where it will compile with no errors, you are not at the end of the debug process, but have reached the beginning!

Included on the disk from Lucidata, is a very complete set of demonstration programs. These are complete enough to demonstrate most if not all of the new features, and many of the old features of Pascal. In my opinion, the hardest part of mastering Pascal will be to absorb all the required variable type declarations. The remainder of Pascal is not unlike the PL languages in structure. In fact, there are trivial differences in the body of programs written in S/PLM and Pascal. These include different delimiters for comments, and the use of WHILE DO rather than DO WHILE etc.

Well, that, along with the program listings included here, just about wraps up the news for this time. Feel free to write and ask questions about materials presented here, and to contribute programs or parts of programs. This column will vary in length and in the ratio of text to programs over a wide range from one time to the next. It will appear approximately bi-monthly, though in order to fulfil my obligation to my original newsletter subscribers, the first four will appear on a monthly basis.



MAR MOD FIG. 1

\*  
 \* TSC 6809 ASSEMBLER SIMULATES 6800 INSTRUCTIONS WITH  
 \* 6809 INSTRUCTIONS. ALL ARE USED HERE TO SEE HOW THEY  
 \* ARE SIMULATED.  
 \*  
 \* THE 6800 INSTRUCTION IS GIVEN FIRST, THEN THE 6809 SUBSTITUTES  
 \* THAT ASSEMBLE TO THE SAME CODE.  
 \*

0000 34 04 ABE0	ABA	0038 1A 10	SEI
0004 34 04	PSHS B	003A 1A 10	ORCC ##10
0006 AB E0	ADDA 0,S+	003C 1A 02	SEV
0008 34 04 A1E0	CBA	003E 1A 02	ORCC ##02
000C 34 04	PSHS B	0040 1F 894D	TAB
000E A1 E0	CMPA 0,S+	0043 1F 89	TFR A,B
0010 1C FE	CLC	0045 4D	TSTA
0012 1C FE	ANDCC ##FE	0046 1F 8A	TAP
0014 1C EF	CLI	0048 1F 8A	TFR A,CC
0016 1C EF	ANDCC ##EF	004A 1F 984D	TBA
0018 1C FD	CLV	004D 1F 98	TFR B,A
001A 1C FD	ANDCC ##FD	004F 4D	TSTA
001C 32 7F	DES	0050 1F A8	TPA
001E 32 7F	LEAS -1,S	0052 1F A8	TFR CC,A
0020 30 1F	DEX	0054 1F 41	TSX
0022 30 1F	LEAX -1,X	0056 1F 41	TFR S,X
0024 32 61	INS	0058 1F 14	TXS
0026 32 61	LEAS 1,S	005A 1F 14	TFR X,S
0028 30 01	INX	005C 3C FF	WAI
002A 30 01	LEAX 1,X	005E 3C FF	CWAI ##FF
002C 34 04 A0E0	SBA		END
0030 34 04	PSHS B		
0032 A0 E0	SUBA 0,S+		
0034 1A 01	SEC		
0036 1A 01	ORCC ##01		

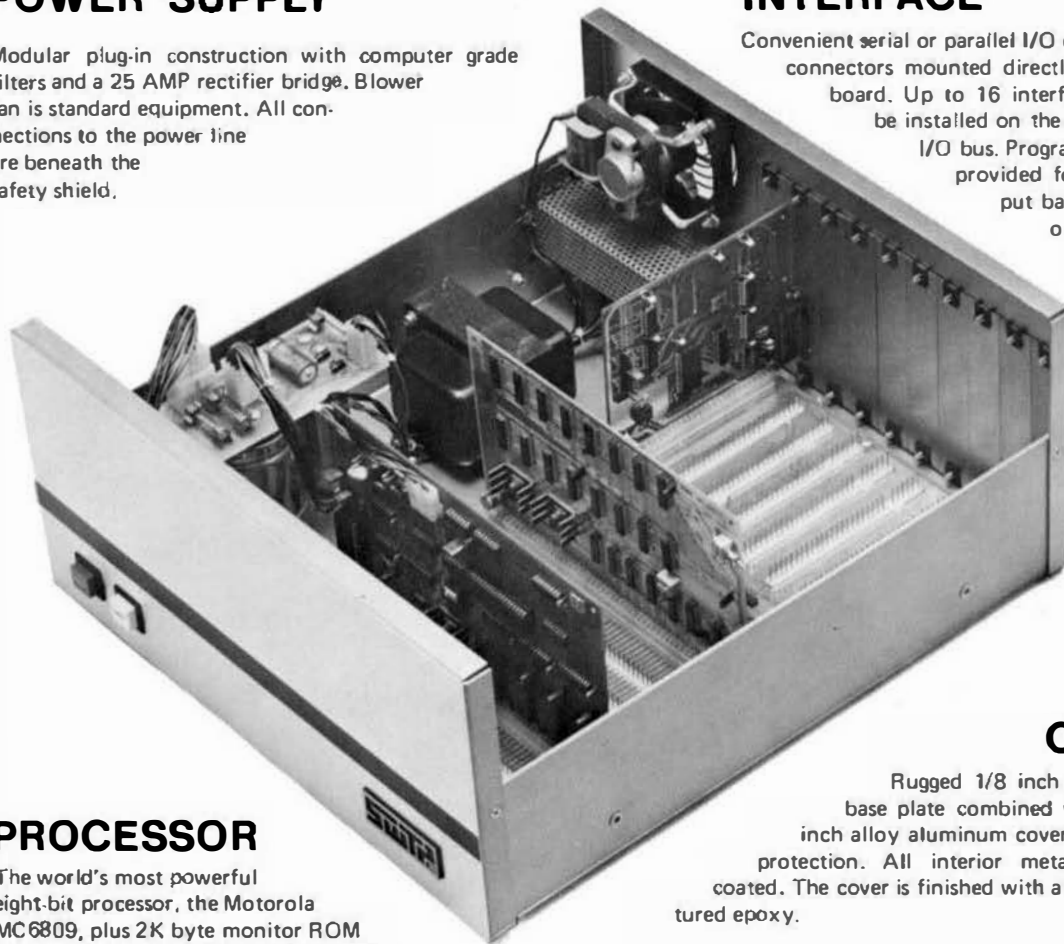
# WE HAVE A 6809 FOR YOU

## POWER SUPPLY

Modular plug-in construction with computer grade filters and a 25 AMP rectifier bridge. Blower fan is standard equipment. All connections to the power line are beneath the safety shield.

## INTERFACE

Convenient serial or parallel I/O cards have DB-25 connectors mounted directly on the circuit board. Up to 16 interface devices may be installed on the address decoded I/O bus. Programming strips are provided for input and output baud rate selection on each port. All outputs are fully buffered.



## PROCESSOR

The world's most powerful eight-bit processor, the Motorola MC6809, plus 2K byte monitor ROM that is 2716 EPROM compatible and full buffering on all output lines. Built-in multiuser capability, just add I/O cards to operate a multi-terminal system.

## CABINET

Rugged 1/8 inch alloy aluminum base plate combined with a solid 1/8 inch alloy aluminum cover for unsurpassed protection. All interior metal is conversion coated. The cover is finished with a super tough textured epoxy.

**MEMORY**— You can purchase the computer with either 8K bytes of RAM memory (expandable to 56K), or with the full 56K. The efficient, cool running dynamic memory used in this system is designed and manufactured for us by "Motorola Memory Systems Inc."

**PERIPHERALS**—The wide range of peripheral hardware that is supported by the 6809 includes: dot matrix printers (both 80 and 132 column), IBM Electronic 50 typewriter, daisy wheel printers, 5-inch floppy disk system, 8-inch floppy disk systems and a 16 megabyte hard disk.

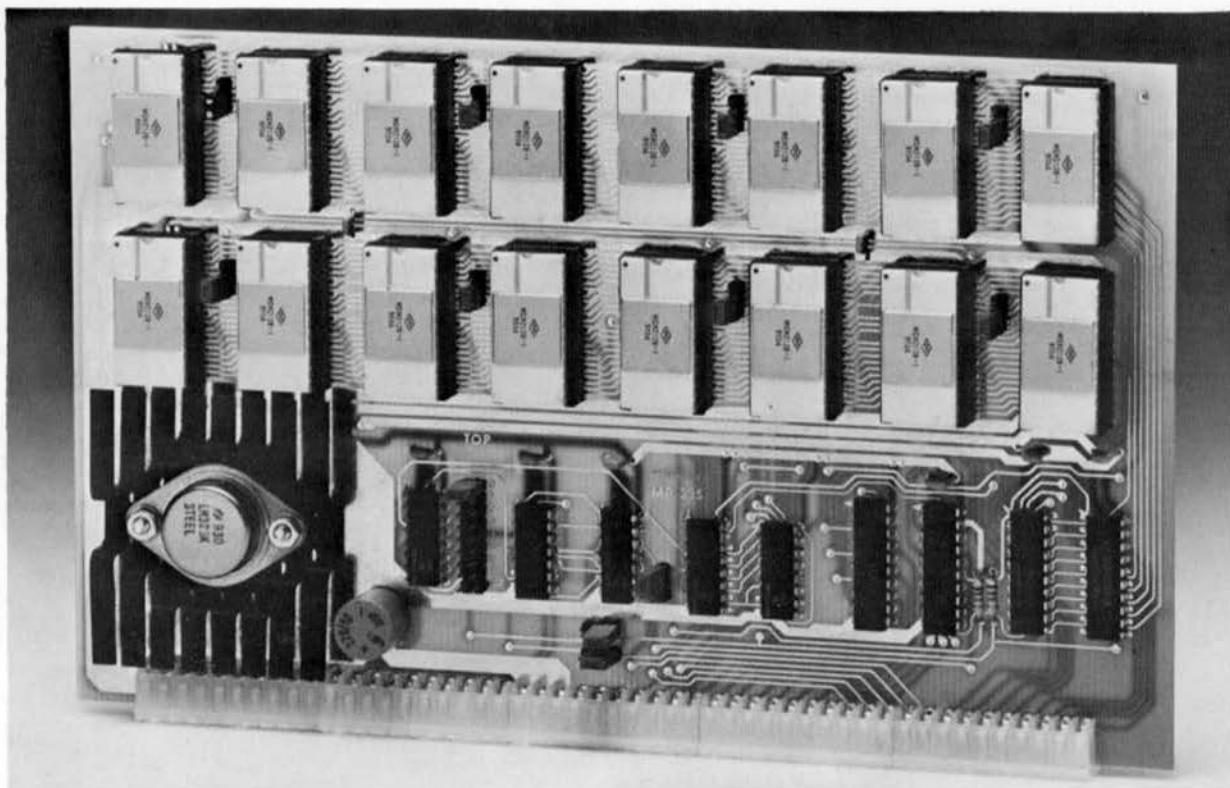
**SOFTWARE**— The amount of software support available for the 6809 is incredible when you consider that it was first introduced in June, 1979. In addition to the FLEX9 operating system, we have a Text Editor, Mnemonic Assembler, Debug, Sort-Merge, BASIC, Extended BASIC, MultiUser BASIC, FORTRAN, PASCAL and PILOT.

69/K Computer Kit with 8K bytes of memory . . . . .	\$ 495.00
69/A Assembled Computer with 8K bytes of memory . . . . .	\$ 595.00
69/56 Assembled Computer with 56K bytes of memory . . . . .	\$1,495.00



SOUTHWEST TECHNICAL PRODUCTS CORPORATION  
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## UNIVERSAL static memory card

- ★ 32K bytes -ROM, RAM, EPROM or a combination
- ★ SS-50 A&C compatible with 16 and 20 bit address decoding
- ★ Compatible with all SWTPC 6800 and 6809 computers

This is the most versatile memory card you can buy. Our S-32 may be populated with up to 32K of static RAM, EPROM, or ROM, or any 4K block combination of these that you may desire. Any 5-volt 2716 pinout compatible memory may be used in this card. Any 4K block of the memory may be jumper block programmed for RAM or ROM use. This feature makes this the ideal memory for those process control applications that require a mixture of ROM and RAM memory. The board is fully compatible with all SWTPC 6800 and 6809 computers.

The power requirement for the board is only 1.75 amps at 5.0 volts with a full 32K of RAM installed.

S-32 Circuit card assembled  
—less memory IC's (uses up to 16). \$99.50

2716 Type EPROM for above . . . . . \$50.00 ea.

16K (2K x 8) Static RAM for above  
(4016 or 2128). . . . . \$50.00 ea.



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## THE BIT BUCKET

Where all that 'good stuff' falls.  
Something for everyone.

We have received in the past few weeks some excellent software. A short review of a couple is in order, mainly because they are worthwhile additions to any user's collection of really good software tools.

First, we received from Southwest Technical Products a copy of their new EDITOR. The EDITOR will be a part of their new word processing package, which will include an output processor (not yet available) and an exceptional or hyphenation dictionary. This should allow advanced word processing, probably on a par with much more expensive software. A report of the processor will be given, in this column, when it is ready for delivery and we have it to examine.

We have become quite comfortable with the present editing and processing package (TSC) that we have been using. It has done well for us and with the addition of the SWTPC package our text processing chores should be easier. We understand that TSC is also working on a new 6809 editing and processing package; as the old saying goes 'feast or famine'!

The EDITOR runs under FLEX™ and handles file names in the customary manner of all FLEX™ files.

The EDITOR runs in two modes; COMMAND and INSERT. It utilizes the 'intelligence' of the SWTPC CT-82 video terminal. This allows complete cursor control in the insert mode. The symbol (>) points to the line being affected. The symbol (:) indicates the command line; that is the line that is not a part of text, scrolled onto the screen, but a reserved line at the bottom of the page that is used for commands, and is never overwritten or blanked.

The keys of the cursor control pad are used by the EDITOR (or the corresponding control character can be used for non-CT-82 users) to move through the file. The 'UP' and 'DOWN' scroll keys scroll text onto the CRT screen. The left and right arrows allow moving forward and backward through the file, paragraph by paragraph. The 'FORM' key scrolls in one complete page at a time. Also the pointer may be moved by using the 'v' key on the regular keyboard. Example: 5v would move you forward five (5) lines in the file. The uparrow is the backward symbol for the above example. Typing 'h' homes to the top or beginning of the file. The 'f' command will 'FIND' or search for a literal string in the file. A backward search is preceded by (-) the minus sign. When a search is successful the 'found' string is highlighted on the CT-82 video terminal. The 'm' or match command is restricted to the current pointed line. Also the 'z' command inserts a scale on the screen, at the pointed line, as below:

123456789 123456789 123456789 123456789 123456789 12

this truncates at the line length set by the 'R' command, which sets the formatted line length on the CRT screen. The 'I' command is the insert command and is functional at the pointed line. When text is being typed in and the line has its length set by the 'R' command, say at 65, then when you redisplay or are entering text and the count gets to the 'R' limit the EDITOR does an automatic C/R and if the last word is long, the EDITOR will move the word to the next line. Tab stops are set by the 't' command. The plus (+) and (-) operators are used with the 't' command to either add or delete tab

stops. The 'ESC' key moves to the next tab stop. Lines can even be split by the 's' command. First you determine where the split should be and then cause that portion of text to be highlighted by the 'f' command. The typing of 's' then will redisplay the line as two lines, split as required. Should you desire to put the line back together again then by using the 'w' command and using the left or right arrow to position to the beginning of the paragraph, typing 'w' and carriage return will 'weld' the line back together again. The XMIT key on the pad is the same function as 'w'. The 'S' splits each word into a separate line. The 'W' welds whole paragraphs together.

Deletes are done in one of three (3) ways, by word, line or paragraph. To delete one word find it with the 'f' command, it will be highlighted when found, then type '=' and it is deleted. To delete an entire line position the (>) to the line and type the 'DELETE' key on the pad and the line is deleted. The 'd' key also does the same function. To delete an entire paragraph position the pointer (>) to the beginning of the paragraph and type 'D' and it is deleted. By splitting lines and highlighting, a variety of ways of deleting unwanted text can be accomplished.

Text changes can be accomplished by the (=) sign:

peek=poke changes the word peek (in the text file) to poke.

Also the highlighting method can be used by the 'f' command and then typing =Junk, whatever was highlighted is changed to Junk. The use of the symbol (@) allows you selective operation. In other words you are asked if this particular item is to be operated on, according to the command. The replies are 'y' for yes and 'n' for no. Pretty simple. Repeats can be terminated at any time by the use of the 'BREAK' key on the pad. Strings may be replaced by an equal number of blank spaces using the vertical bar. Commands and functions may be combined for multiple operations from one command string.

The text may be moved by using the 'C' key (cut), the cut beginning at the pointed line and continuing to the end of the paragraph. It is stored for later use. The 'c' command cuts only the current pointed line. When you have all the lines cut and are ready to insert them at another point in the text you would use the 'p' (paste) command. This will happen at the line where you have moved the pointer. The copy command is 'N' to copy (but not remove the current text) for a paragraph and 'n' for just one line. They work just like the cut commands but do not remove any text from the file.

The EDITOR may be exited by the 'e' command or the 'x' command. When the 'e' command is used you are asked: Are you sure?. If your typed reply is yes then it is written to the disk as the primary (.TXT) file and the original, if any, becomes a (.BAK) file. If you should decide that you do not want to save the revision you have just completed, then typing 'x' and the prompt returning as above, your answer of 'y' will cause everything to be just as it was prior to your starting the editing session.

One important aspect of the entire operation is that the EDITOR is a 'window' editor. That is you may scroll completely through any file on the disk. File size seems to be of little importance, as to the effective operation of the EDITOR.

We have been using it for the past month or so, first with an initial version, and just in the last

day or so with a final and so far bug free version. My reaction to this piece of software is that it is one of the finest editing programs I have used. It has a few features missing that I would have desired to have available especially since we use all CT-82 video terminals. The CT-82 is a cursor controllable video terminal (and a dependable one). The one that I am using is one of the very first that SWTPC shipped. It has been upgraded to the current version by the addition of another monitor ROM and the strapping of two points on one circuit board. (available from SWTPC as a \$29.95 modification) The thing that I would have liked to have seen Norm and Dennis include is cursor position, single character, and string deletes and insertions. The CT-82 allows for these functions and should not be difficult to make (gotcha Norm and Dennis). But then I guess that is why my copy was received with a coverleaf that had the following:

Dedicated to Don Williams - Who wanted just one more feature -

### BUSINESS PROGRAMS (Holding)

For the past few weeks we have received numerous communications concerning problems with the 'business programs' in BASIC, published in recent past issues of 68 Micro Journal.

More than a few thought that they would get them straight and also others say that they are redoing them for other versions of BASIC. Everyone I have talked to about them promised to send us a complete listing, to replace the ones published previously.

I was pleased that so many of you stated that they were basically a worthwhile tutorial project, problems or not. If we get listings of a better version, using random files and written for other versions of BASIC, then it will have been a good project.

Next time we will enter them in a machine and try them out before we publish any source listings, or mail out any disk. In most all cases we just do not have the personnel to run all programs published.

Effective immediately we are suspending shipping of any more disk with the programs in source. Also we will wait a few weeks or so and see what the fixes we receive look like.

If you sent for and received a disk in the original (defective code) format there are two recourses available to you. First we will cheerfully refund your money upon return of the disk. Second, we will, when we get a bug-free copy going replace your disk with an update, merely by sending in the old disk, after we publish information concerning the fixes. You may elect either one of the above.

Please accept my regrets for the present state of this series, but I do believe that it will work out fine, as I personally know three (3) local 6800/09 users who are redoing the project and they are all making progress. I sincerely hope to have a GOOD version for all of you soon!

DMW

### CLASSIFIED ADVERTISING

WANTED - 1 DMAF-1 DISC CONTROLLER BOARD AND DOCUMENTATION. ANY CONDITION, CALL 717-486-3593 AFTER 5 P.M. EST.

### HELP

Dear Sir,

If anyone has information on sources for Ham Radio related programs for the SWTPC 6800 (or other 6800 based computer system), I would be very grateful if you could send me details. Although I do not yet have an amateur radio license, I would like to get one. There must be someone out there who has written a program to have my SWTPC 6800 computer teach me Morse Code. Any other Ham Radio related programs would also be of interest. I'll be happy to pay reasonable copying costs, etc. Many thanks.

Sincerely yours,  
TONY NIESZ  
31 Winnett Street  
Hamden, CT 06517

Rudolf Reuter

Drususstraße 62  
6200 Wiesbaden  
West - Germany  
13. March 1980

68 MICRO JOURNAL  
3018 Herill Road  
P.O. Box 849  
Nixon, Tennessee 37363

Dear Mr. Don Williams

Referring to my letter of Feb. 13th with the article "Put the 6800 and 6809 together on the SS-SO bus" I send you an correction about two things which I overlooked in the article:

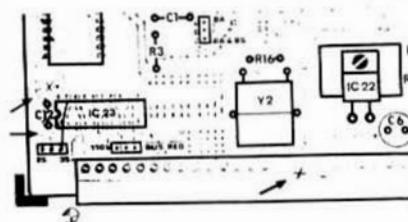
In paragraph 2.1. the point "pin1 of IC23" should read "pin36 of the jumper 25/35".

For the MP-09 board there must be an additional paragraph 1 2.5. Cut the bus connector pin BUSV (NOT) from ground, otherwise the RW for the 6800 is always pulled down to ground.

I have now modified three SWTPC computer systems with this modification and all operate well.

With best regards

*Rudolf Reuter*



## The SWTP Power Supply Upgrade by Russell Gorr

If you have a SWTP 6800 system with most of slots of the motherboard filled, and you are using an unmodified SWTP power supply, you may find some strange things happening with your system from time to time. You'll notice this if programs begin to "bomb" at random - more frequently. What your system may be trying to tell you is that you need to upgrade your SWTP power supply. This can be done using most of the parts already in the power supply.

You can check to see if you're "cutting it close" on the +5 volt supply by measuring the

voltage across C3 (the large electrolytic). If the voltage is very close to +7 volts DC, you need the upgrade.

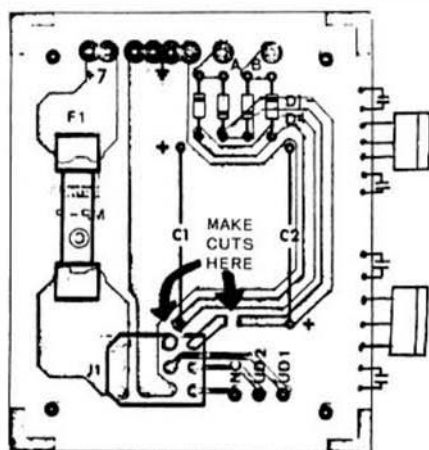
As mentioned, you'll be using most of the parts in the present mainframe power supply. The major expense will be a new transformer which is available at local electronic supply houses for around \$25. Once upgraded, your supply will have +8 volts DC at 20A, +15 volts DC regulated at 1.5A, and -15 volts DC regulated at 1.5A.

#### Power Supply Upgrade Parts List

- T1 - Triad F-199-U transformer
- IC1 - 7815 voltage regulator IC
- IC2 - 7915 voltage regulator IC
- C4-C7 - 1uF 35 volt tantalum capacitors
- F1 - 3AG 20A fuse
- F2 - 3AG 4A Slo-Blow fuse
- optional: 2 heatsinks and hardware for the two ICs, 1-terminal strip, 3-slip-on lugs for the bridge rectifier, wire.

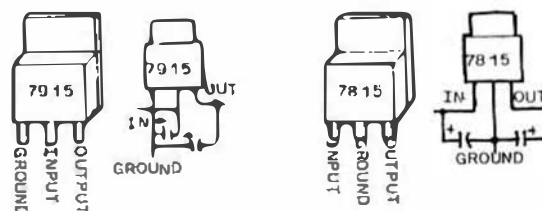
#### Procedure

- ( ) First disconnect the AC power to the system!
- ( ) Next remove the motherboard from the mainframe. Disconnect the connector plugged into the power supply PC board. Disconnect the other wires connected to the switches.
- ( ) Disconnect the wires going to the cap C3. Remove the cap and set it on the side. You will need it later, but it'll be easier to make the mods with the cap out for now!
- ( ) Begin by removing the SWTP transformer from the mainframe. When removing the soldered wires you may wish to cut them, leaving a 1/4" on the PC board, fuseholder and terminal strip.
- ( ) You will need to drill new mounting holes in the mainframe. First position the transformer in the case and mark the holes with a pencil. Remove the transformer and drill the holes. Mount the transformer.



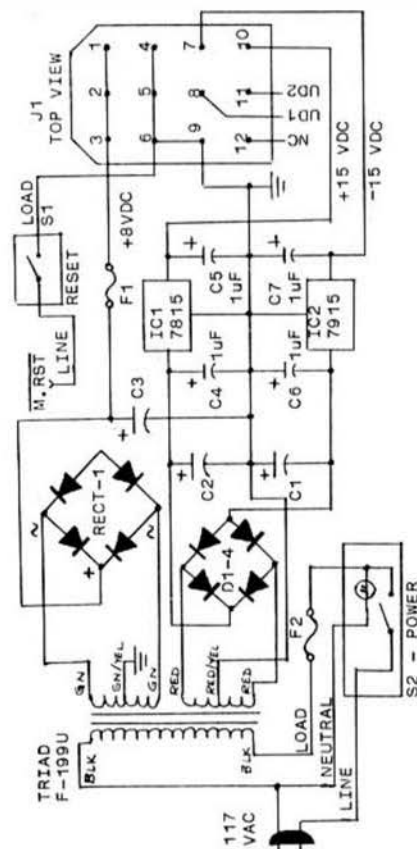
Holes for mounting other components are to the right of capacitor C2.

- ( ) Next remove the ground wire from the PC board. You should have already removed the motherboard from the mainframe so there shouldn't be any other wires connected to the PC board. Remove the PC board.
- ( ) With an exacto knife or razor blade, make a cut in the trace between the + side of C2 and connector J1. Make a cut in the trace between the - side of C1 and connector J1. See the figure below for the locations.



- ( ) You will need to mount the 2 voltage regulators and 4 tantalum caps on a PC board. You may wish to put them on a small piece of perf board. If you have access to a PC board drill, you can drill holes on the SWTP PC board and mount them on the board. If you do this, you will find that you have the most room on the side opposite of the fuseholder. The diagram gives a suggested layout for this.

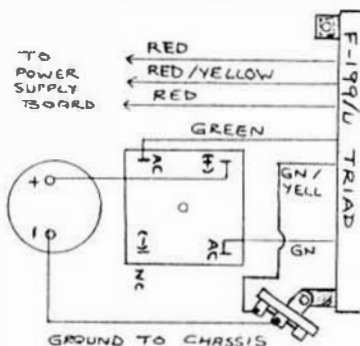
- ( ) With the caps and ICs mounted on the board first connect the capacitors to the leads of the 7815. Note that the caps are polarized. The figure below labels the leads of the IC.



- ( ) Connect the caps to the 7915 IC according to the figure above.
- ( ) Connect the grounds of the two ICs together. Connect the ground of the power supply board to this ground connection. If you are using a separate board make sure you leave enough wire between where you are going to mount the board and the SWTP board.
- ( ) Connect a wire between the - side of C1 and the input lead of the 7915.
- ( ) Connect a wire between the output lead of the 7915 and pin 7 of connector J1. (on board)



- ( ) Connect a wire between the + side of C2 and the input lead of the 7815.
- ( ) Connect a wire between the output lead of the 7815 and pin 10 of connector J1.(on board)
- ( ) Mount heatsinks on the regulators and replace the 10A fuse on the board with a 20A fuse.
- ( ) Mount a small terminal strip to the mainframe. Attach all the terminals together and make sure it has good contact with the chassis. (You may have to drill a hole, but you may have an open one from the transformer's other holes. You may also connect it to one of the legs of the new transformer.)
- ( ) Mount the new transformer to the chassis.
- ( ) Connect the primary wires (the black ones). One lead goes to the fuseholder and the other goes to the old terminal strip.
- ( ) Connect the +15 CT wire to the new ground terminal strip (green and yellow wire).
- ( ) Remount cap C3 in chassis. Attach the + lead of the cap to the + terminal on the bridge rectifier. Attach the - lead of the cap to the terminal strip that has the CT wire.
- ( ) Put lugs on the two green leads of the transformer(optional), or solder these wires to the two AC inputs on the bridge rectifier.



- ( ) Connect the two red leads of the other secondary of the transformer to the points "A" and "B" on the SWTP power supply board.
- ( ) Connect the other CT wire (red/yellow) to the ground connection on the SWTP power supply board. While you are doing this, also connect the other ground wire from the terminal strip as well (this is the one you took off before).
- ( ) Replace the 2A Slow-Blo fuse in the fuseholder.
- ( ) Snap the SWTP power supply board back into place. If you are using a separate board for the voltage regulators, mount this as well.
- ( ) Reconnect the motherboard with all the boards out of it. Reconnect the switch wires and the connector to the SWTP power supply board.
- ( ) Plug the mainframe into AC, stand back and hit the power switch "on". If all goes well there will be no blown fuses or fire.
- ( ) With a meter check the +7 volt buss on the motherboard. You should read between 8 and 11 volts DC. If not turn the system off!
- ( ) If you didn't turn your system off, check the + and - 12 volt pins on the motherboard. You should be reading + and - 15 volts DC. If you don't, shut the system off!
- ( ) If you still have the power on, then your system is working. Shut off the power and plug your boards back in, you're ready!
- ( ) If you have a problem with the 7 volts then check the leads on the bridge, the center tap wire going to the ground terminal strip. Make sure this strip is making good contact with the case. Check the C3 wiring. The - lead is going to the terminal strip. The +

lead is going to the SWTP power supply board. Make sure there is nothing connected to the negative terminal of the bridge. Check fuses.

- ( ) If you don't have +15 volts, check the wiring of the 7815. Check the connections to C2 and connector J1.
- ( ) If you don't have -15 volts, check the wires for the 7915 and the connections at C1 and J1.
- ( ) If you don't get either + or - 15, check the wiring to points "A" and "B", D1-4, and the center tap wire going to ground. You can do a quick check by temporarily disconnecting the wires on C1 and C2 and check for voltages. If you disconnect the wires, mark which one is what first!

That's it. You're set to go. One thing about the + and - supply at 15 volts: you have this voltage available for other projects or boards if you do some tinkering with D/A or A/D. You do need the regulators in the circuit; without them you'll get 25 volts for an input on the 12 volt line, which might damage circuitry. It is also better to have this regulator go, since it provides some voltage protection, than a board in your system (a built in fuse!).

## Two For The Price Of One SWTP'S MP-C by Richard Down

Owners of Southwest Technical Products 9800 computers will be familiar with the MP-C Serial Control Interface used to interface a serial terminal, such as the CT-1024, to the computer. This interface is a peculiar thing. It uses a parallel interface chip, the MC6820, to perform a serial interface function. This requires some associated hardware on the board plus software incorporated in the MIKBUG ROM.

Largely as a result of this peculiar design, the MP-C board has available on it unused hardware which can be utilized to interface a second serial terminal, at virtually no cost. In my case, I am using the same MP-C board for both a CT-1024 terminal, for which it was originally bought, and for a Model 15 Teletype.

Even though both the CT-1024 terminal and the Model 15 Teletype are served though the same board, they operate quite independently. The CT-1024 terminal is connected to PORT #1 (by convention with SWTP) and the Teletype is connected to PORT #5. Either port can be called up by the software.

The Model 15 Teletype could not be directly connected to the MP-C, as supplied, for several reasons. The MP-C can be used for an ASCII coded, 20mA, Teletype at 110 baud. However, the Model 15 Teletype uses BAUDOT code, requires a 60mA loop, and operates at 50 baud. Software is therefore used to translate from ASCII to BAUDOT and to transmit BAUDOT at 50 baud to PORT #5. PORT #5 controls an interface at the Teletype which supplies 60mA at 120V.

To understand the following, it is desirable to have available the documentation supplied by SWTP; both that for the MP-C as well as their System Documentation Notebook. References is specifically made to the IC's as numbered in the schematic supplied with the MP-C.

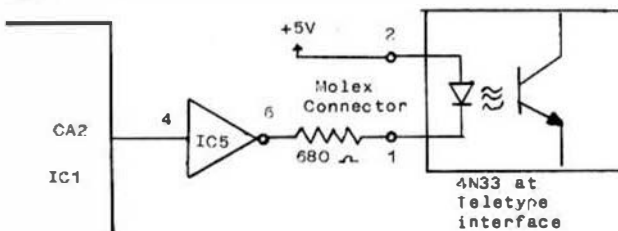
My Teletype is interfaced using the CA2 line of the MC6820 chip as an output (pin 39 of IC1). This line is not used in the interface as originally supplied. The pin is soldered to an unconnected pad on the printed circuit board.

The circuit used is copied from one already

in use on the board; that for the C82 line. This utilizes one quarter of IC5, a quad RS-232 receiver (to drive IC8), and a 4N33 optical coupled isolator. I felt that I could not go wrong if I did as they had already done.

A spare quarter of IC5 was stolen from unused circuitry on the board. The board is designed to interface to either a RS-232 terminal, such as the CT-1024, or to a 20mA Teletype. Since I was not using a 20mA Teletype, I stole a quarter of IC5 from that part of the circuit.

Similarly, a 4N33 opto-isolator could also have been stolen (IC9 is available, for example). However, I chose to locate a separate 4N33 at the interface to 120V which is installed on the Teletype itself.



IC1 - MC9820 Peripheral Interface Adaptor  
IC5 - Quad RS-232 Receiver

Specific instructions for making this modification to the MP-C are as follows:

1. Cut traces from IC5, pins 4 and 6
2. Use epoxy glue to fasten a Molex connector to the edge of the board.
3. Add a jumper from IC1-pin 39, to IC5-pin 4.
4. Add a jumper from IC5-pin 6, to a 680 ohm resistor. Connect the other end of the resistor to pin 1 on the Molex connector.
5. Add a jumper from the +5V regulated supply to pin 2 of the Molex connector.

The total cost of the bits and pieces used here to be less than one dollar.

For instructions on how to program the CA2 line of the MP-C as an interface port, refer to the Systems Documentation notebook. However, it is probably useful to know that, with the MP-C installed on PORT #1, that the address assignment of the CA2 line is \$8005.

Several magazine articles have been written about peculiarities of the MP-C and the uses that can be made with them. One recent issue is the March 1978 issue of Kilobaud. The idea for this application certainly came from these articles, which I gratefully acknowledge, although I have not seen this particular use published.

As described in this article, the extra interface is used for a Teletype; but it could just as well be used to control any other piece of external equipment. So, SWTP owners, go ahead, get an extra interface for almost no cost.

"Two For The Price Of One: SWTP'S MP-C", by Richard F. Down, appears courtesy the TRACE newsletter, July 1978.

Credits: The SWTPC Power Supply Upgrade and Two for the price of One - SWTPC MP-C; extracted from the Amateur Computer Group of New Jersey Newsletter.

## TSC NEWDISK FIX

In response to a written request, TSC recently sent me (within 10 days!) a patch to NEWDISK (MF-68 FLEX 2.0) to cause

it to format all 40 tracks on a Wangco or similar 40-track drive. This came on TSC letterhead entitled "RE: Changing the FLEX 2.0 NEWDISK Routine to Format 40 Tracks". Here is the patch they sent:

- 1) Change A1EC from \$23 to \$28
- 2) Change A245 from \$23 to \$28
- 3) Change A286 from \$0154 to \$0186
- 4) Change A2EA from \$23 to \$28
- 5) Change A3BF from \$22 to \$27

In case any one else got this sheet from TSC, the patch as given is INCOMPLETE. NEWDISK forgets to make the "Last Available Sector" bytes in the System Information Record equal to \$27-\$0A (track 39, sector 10). The effect is that although CATALOG reports 390 free sectors, only 340 are usable before ALL AVAILABLE DISK SPACE HAS BEEN USED comes up.

It turns out TSC forgot to patch one additional location:

- 6) Change A28B from \$22 to \$27

There! Now 12,600 additional bytes are free on every diskette, at no additional cost! I do not know if TSC sent this sheet to anyone else, but all FLEX 2.0 users using 40-track drives should find this useful. Of course, only the first 35 tracks of the new 40-track diskette are readable by Shugart drives. If you must send a file to someone with these drives, make sure the file does not occupy any track above 35. Other than that, 35-track disks and 40-track disks are completely interchangeable.

Ken Stamm  
15 E 91 ST  
NYC NY 10028

IS A 4800 FIVE TIMES FASTER THAN A PDP-11/707

By Paul Pennington

A review of a new computer in the January 1980 Interface Age magazine, the Digital Microsystems HEX80, listed the following times "using an identical benchmark program that computes all the prime numbers from 1 to 1000".

COMPUTER	TIME
DEC PDP 11/70	45 seconds
HEX80	143 seconds
DEC PDP 11/45	336 seconds
DEC PDP 11/20	1140 seconds
IBM 5110	1620 seconds
Z-80	2400 seconds
IBM 5100	3720 seconds

Joe Pontecost, of the 6800 working group in Atlanta, wrote the following program in TSC BASIC to solve the same problem. It runs in 8 seconds on a standard Mx 6800. Once again, the importance of the software, whether it be the BASIC interpreter/compiler or the program written in BASIC, looms large over the hardware.

```

1 REM PRIME NUMBER DERIVATION TO 1000 USING ERATOSTHENES SIEVE.
2 REM CONSIDER ODD NUMBERS ONLY; ODD FACTORS <1000, 1 ONLY.
3 REM SET UP ARRAY; REMOVE NON-PRIMES; PRINT 2 AND REMAINDER.
10 DIM P(1001)
20 FOR I = 3 TO 999 STEP 2
30 P(I) = 1
40 NEXT I
50 FOR I = 3 TO 31 STEP 2
60 IF P(I) = 0 THEN 110
70 L = I
80 L = L * I
90 P(L) = 0
100 IF L < 999 THEN 80
110 NEXT I
120 PRINT "2"
130 FOR I = 3 TO 999 STEP 2
140 IF P(I) = 0 THEN PRINT P(I);
150 IF P(I) = 0 THEN PRINT
160 NEXT I
170 END

```

John H. Deal  
1235 Milano Drive  
Naples Florida 33940  
813-261-0536

#### Program "D-TOWERS"

This is an adaptation of the ancient game of Towers, from various available programs under that and similar names. Several innovations have been added to make for easier playing of the game. One of these is that regardless of the number of discs you choose to play with, they are always numbered from 1 (the smallest disc) in ascending order. Another tells you the smallest number of moves that can win the game of your choice, keeping track of the number of moves you have made. Finally, in addition to other minor changes, there is one major addition to help you solve the puzzle. This is in the printing of the Binary Number of your current move just to the right of the sentence 'THIS IS YOUR MOVE NO. -'. The correct move you should make can be determined from this Binary number. If you are interested in knowing how to solve the puzzle, please send Legal Size S.A.S.E. for the instructions.

This program should be adaptable to most Basics with perhaps minor modifications, unless you are limited to the

number of For-Next loops which may be active. CHR\$(12) clears screen and homes to upper left. Other than this the listing is explanatory.....Have fun !.

#### "D-TOWERS"

```

1000 REM - PROGRAM 'D - TOWERS' - T.S.C. BASIC D
1020 PRINT CHR$(12);
1040 PRINT "TOWER GAME"
1060 PRINT:PRINT
1080 PRINT:YOU MUST TRANSFER THE DISCS FROM THE LEFT TO THE RIGHT NEEDLE -
1100 PRINT:ONE AT A TIME, NEVER PUTTING A LARGER ON A SMALLER DISC:PRINT
1120 PRINT:THE DISCS ARE NUMBERED FROM 1 TO 7. THE SMALLER DISC IS NO. 1.
1140 PRINT:THE MAXIMUM NUMBER OF DISCS YOU MAY USE IS 7.
1160 PRINT:THE NEEDLES (TOWERS) ARE NUMBERED 1 TO 3, LEFT TO RIGHT.
1180 PRINT:START WITH THE DISCS ON NEEDLE 1 AND ATTEMPT TO MOVE THEM"
1200 PRINT:TO NEEDLE 3.
1220 PRINT:PRINT:GOOD LUCK !!:PRINT
1240 REM - INITIALIZE
1260 DIM T(7,3):DIM P(8):E=0
1280 E=0
1300 FOR D=1 TO 7
1320 FOR N=1 TO 3
1340 A=0:B=0
1360 LET T(D,N)=0
1380 NEXT N
1400 NEXT D
1420 M=0
1440 IF E=3 GOTO 1540
1460 PRINT:HOW MANY DISC DO YOU WANT TO MOVE (7 MAX) :
1480 INPUT S:PRINT
1500 IF S=2 THEN PRINT:BE ERIDUB !!:E=E+1:GOTO 1440
1520 IF S=7 THEN PRINT:TOO MANY DISCS !!:E=E+1:GOTO 1440
1540 IF E=2 THEN PRINT:START OVER !!:PLAY RIGHT !!:END
1560 V=7:D=15
1580 FOR X=8 TO 1 STEP -1
1600 T(V,1)=D:D=D-2:V=V-1
1620 NEXT X
1640 GOSUB 3200
1660 GOSUB 3840
1680 GOSUB 3980
1700 PRINT:PRINT:MOVE WHICH DISC ? :E=0
1720 INPUT D
1740 IF S=2 THEN 4340
1760 IF S=3 THEN 4480
1780 IF S=4 THEN 4620
1800 IF S=5 THEN 4760
1820 IF S=6 THEN 4900
1840 IF S=7 THEN 5040
1860 D=2*D+1
1880 IF D=8 THEN PRINT:PRINT:MISTAKE IN DISC NUMBER !!:GOTO 1700
1900 IF (D-3)*(D-5)*(D-7)*(D-9)*(D-11)*(D-13)*(D-15)=0 THEN 2020
1920 PRINT:ILLEGAL ENTRY !!:ENTE ONLY 1 THRU "15
1940 E=E+1:IF E=2 THEN 1980
1960 GOTO 1720
1980 PRINT:SO LONG !!:PESTER SOME ONE ELSE !!:
20 END
2020 REM - 16 DISC BELOW ANOTHER
2040 FOR R=1 TO 7
2060 FOR C=1 TO 3
2080 IF T(R,C)=D THEN 2120
2100 NE T C:NEXT R
2120 FOR Q=R TO 1 STEP -1
2140 IF T(Q,C)=D THEN 2180
2160 IF T(Q,C)=0 THEN 2220
2180 NEXT Q
2200 GOTO 2260
2220 PRINT:THAT DISC IS BELOW ANOTHER !!
2240 GOTO 1700
2260 E=0
228 IF E=2 THEN 2420
2300 PRINT:PLACE DISC ON WHICH NEEDLE ? :INPUT N:PRINT
2320 IF (N-1)*(N-2)*(N-3)=0 THEN 2460
2340 LET E=E+1
2360 IF E=2 THEN 2420
2380 PRINT:YOU HIT THE WRONG KEY !!:WATCH IT !!
2400 GOTO 2300
2420 PRINT:YOU WOULD'NT LISTEN !!:GOOD BYE !!:END
2440 REM - LOCATE DISC TO BE MOVED
2460 FOR R=1 TO 7
2480 IF T(R,N)=D THEN 2540
2500 NEXT R
2520 GOTO 2640
2540 REM - CHECK PLACING OF DISC
2560 IF D(T(R,N)) THEN 2640
2580 PRINT:YOU CANT PLACE A LARGER DISC ON A SMALLER ONE!!:E=E+1
2600 PRINT:HOW THEN. ?
2620 GOTO 2280
2640 FOR V=1 TO 7:FOR W=1 TO 3
2660 IF T(V,W)=D THEN 2720
2680 NEXT W:NEXT V
2700 REM - FIRST EMPTY SPACE ?
272 FOR U=1 TO 7
2740 IF T(U,N)=0 THEN 2820
2760 NEXT U
2780 GOTO 2840
2800 REM - MOVE DISC
2820 U=U-1
2840 T(U,N)=T(V,W):T(V,W)=D
2860 REM - PRINT STATUS
2880 GOSUB 3200
2900 REM - DONE ?
2920 M=M+1
2940 FOR R=1 TO 7:FOR C=1 TO 2
2960 IF T(R,C)=0 THEN 3020
2980 NEXT C:NEXT R
3000 GOTO 3080
3020 IF M=128 THEN 1660
3040 PRINT:SORRY, ONLY 128 MOVES ALLOWED !!
3060 END

```

#### 6809 DIAGNOSTICS AND DISK REPAIR

```

3080 REM
3100 PRINT "GOOD !! YOU'VE DONE IT IN "M" MOVES"
3120 INPUT "TRY AGAIN (YES - NO) " : A$
3140 IF LEFT$(A$,1) = "N" THEN 3020
3160 IF LEFT$(A$,1) = "Y" THEN PRINT CHR$(12)
3180 GOTO 1280
3200 REM - PRINT SUBROUTINE
3220 IF B=2 THEN 4320
3240 IF B=3 THEN 4460
3260 IF B=4 THEN 4600
3280 IF B=5 THEN 4740
3300 IF B=6 THEN 4880
3320 IF B=7 THEN 5020
3340 PRINT TAB(10); "1" TAB(29); "2" TAB(48); "3"
3360 PRINT TAB(10); "-----"
3380 FOR X=1 TO 7
3400 I=X*10
3420 FOR J=1 TO 3
3440 IF T(K,J)=0 THEN 3700
3460 PRINT TAB(I+INT((K-J)/2));
3480 FOR V=1 TO T(K,J)
3500 IF T(K,J)=3 THEN IF V=2 THEN PRINT A$; GOTO 3660
3520 IF T(K,J)=5 THEN IF V=3 THEN PRINT B$; GOTO 3660
3540 IF T(K,J)=7 THEN IF V=4 THEN PRINT C$; GOTO 3660
3560 IF T(K,J)=9 THEN IF V=5 THEN PRINT D$; GOTO 3660
3580 IF T(K,J)=11 THEN IF V=6 THEN PRINT E$; GOTO 3660
3600 IF T(K,J)=13 THEN IF V=7 THEN PRINT F$; GOTO 3660
3620 IF T(K,J)=15 THEN IF V=8 THEN PRINT G$; GOTO 3660
3640 PRINT " ";
3660 NEXT V
3680 GOTO 3720
3700 PRINT TAB(I+1); "0"
372 I=I+10
3740 NEXT J
3760 PRINT
3780 NEXT K
3800 RETURN
3820 PRINT "THANKS FOR THE GAME " : PRINT
3840 END
3860 REM - MIN. NO. MOVES TO WIN
3880 FOR X=1 TO 8
3900 N=2-X
3920 NEXT X
3940 PRINT "YOU CAN WIN WITH "M" MOVES"
3960 RETURN
3980 A=A+1:PRINT "THIS IS YOUR MOVE NO. " : A$
4000 REM - BINARY SUBROUTINE
4020 D=A
4040 IF D/16 THEN F=4:GOTO 4080
4060 IF D/8 THEN F=8
4080 FOR D=1 TO F
4100 I=D/2
4120 L=INT(I)
4140 IF I=L THEN P(D)=1
4160 IF I=L THEN P(D)=0
4180 G=L
4200 NEXT D
4220 FOR D=F TO 1 STEP -1
4240 PRINT TAB(50); P(D);
4260 NEXT D
4280 RETURN
4300 END
4320 F1=1:G1=2:GOTO 3340
4340 B=13
4360 FOR X=1 TO 7
438 IF B=X THEN 4420
4400 NEXT X
4420 D=D+5
4440 GOTO 1860
4460 E1=1:F1=2:G1=3:GOTO 3340
4480 B=11
4500 FOR X=1 TO 7
4520 IF D=X THEN 4560
4540 NEXT X
4560 D=D+4
4580 GOTO 1860
4600 D1=1:E1=2:F1=3:G1=4:GOTO 3340
462 B=9
4640 FOR X=1 TO 7
4660 IF D=X THEN 4700
4680 NEXT X
4700 D=D+3
4720 GOTO 1860
4740 C1=1:D1=2:E1=3:F1=4:G1=5:GOTO 3340
4760 B=7
478 FOR X=1 TO 7
4800 IF D=X THEN 4840
4820 NEXT X
4840 D=D+2
4860 GOTO 1860
4880 B1=1:C1=2:D1=3:E1=4:F1=5:G1=6:GOTO 3340
4900 B=5
4920 FOR X=1 TO 7
4940 IF D=X THEN 4980
4960 NEXT X
4980 D=D+1
5000 GOTO 1860
5020 A1=1:B1=2:C1=3:D1=4:E1=5:F1=6:G1=7:GOTO 3340
5040 B=3
5060 D=D
5080 GOTO 1860
5100 END

```

READY

Technical Systems Consultants, Inc. announces the availability of a memory diagnostic and disk repair package for the MC6809 advanced microprocessor. The utility programs in this package are designed to run under the 6809 FLEX™ operating system. Included in the memory diagnostics portion of the package are: zeroes and ones test, random pattern test, walking hit tests, dynamic ram dropout test, and a convergence test. All memory tests are position independent. The disk repair portion of the package contains utilities which operate on a FLEX-formatted diskette. Included are 3 diagnostic utilities which report unreadable sectors and structural inconsistencies among the files on the diskette, 2 utilities for recovering data when the directory on the diskette is not readable, a utility to remove bad or intermittent sectors from the free space, a program to retrieve deleted files from the diskette free chain, a single-sector read/write/modify routine, and a copy utility which ignores CRC errors. The manual includes descriptions of the diagnostics, some background information on types of errors, and troubleshooting guides. The price is \$75.00, available on 5" or 8" diskette. Source listings are available separately, contact company for a quotation. Technical Systems Consultants, Inc., Box 2570, West Lafayette, Indiana, 47906. (317) 463-2500, Telex 27-6143

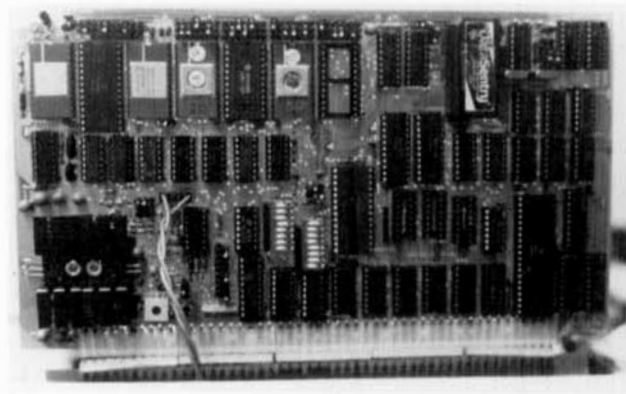
#### NEW PRODUCTS INFORMATION - FOR IMMEDIATE RELEASE

P.O. Box 2570 • 1208 Kent Avenue • West Lafayette, Indiana 47906 • (317) 463-2502

#### GIMIX 6809 CPU

We have just received information and 'firm' rumors concerning the new 6809 CPU card from GIMIX. This unit should be available within the next four to six weeks.

In addition to the advertised features of the CPU card the following features are to be available.



1. Battery backup - which will maintain the 1K CPU RAM and the real time clock, for a period exceeding 900 hours.

2. Software write protect - this can be accomplished, in software for 4K blocks of main RAM.

3. Monitors - the CPU card can operate with any 2708, 2716 or 2732 EPROM monitor or ROM monitor that has the same pinouts. Also available are sockets to hold 2K RAM chips allowing any monitor on disk or



tape to be dumped to the 2K RAM and then be used as the system monitor. This method allows use of all existing monitors, that I am aware of.

4. The GIMIX CPU card will operate in any standard 6809 mainframe but does not restrict the user to a GIMIX mainframe.

We saw the new 6809 CPU card running at the faire in San Francisco and it functioned as expected, without a hitch. See the GIMIX advertisement page 4 for additional details.

DMW

## News Release

ATTENTION TO: Editor  
SUBJECT: Series 2000 Complete Microcomputer System  
FOR RELEASE: Feb. 1, 1980  
FOR CLIENT: WAVE MATE, Inc.  
FROM AGENCY: Allan Franklin Advertising  
ENCLOSURES: B/W Photograph attached

UCSD PASCAL AND 'DAM' FLOPPY HIGHLIGHT DEBUT  
OF WAVE MATE SERIES 2000 COMPLETE MICRO

Carson, CA - Wave Mate, Inc., manufacturer of the 5 year old Jupiter family of microcomputers, has announced the availability of its new Series 2000 microcomputer system, and to accompany it, the UCSD Pascal System Software Package. The Series 2000 is a complete stand alone system which is packaged in an attractive, compact, desk top enclosure. It includes the following hardware: double mini floppy disk drive and controller, two high speed microprocessors, 64K bytes of dynamic RAM, boot ROM, 12" CRT, commercial keyboard with function keys and numeric pad, two serial ports, and the provision to attach a Winchester disk in the near future.

The UCSD Pascal System Software Package has been adapted by Wave Mate to operate on the Series 2000 microcomputer system. The package includes: disk operating system with file handler, one pass Pascal compiler producing universal P code, full screen and character editor, conditional macro assembler, linker, P code interpreter, utility library.

The ultra compact packaging of the Series 2000 has been accomplished primarily due to the use of the newly available double mini floppy disk drive, 'Another DAM Floppy'. This unit provides two independent 5 1/4" double density disk drives in the physical space of a single 5 1/4" drive. The Series 2000 has been designed and built to feature reliability, portability, and ease of service. The total weight of the complete system is less than 50 pounds.

A complete Series 2000 microcomputer system including the UCSD Pascal package has an end user price of \$3,450. This system comes with 64K bytes of RAM and 368K bytes of formatted disk storage. A 32K byte RAM system without Pascal has an end user price of \$2,895. Attractive OEM and dealer discounts are being offered. The system operates on either 115VAC/60Hz or 230VAC/60Hz.



### Client Contact:

Steven Schneider  
General Manager  
WAVE MATE, Inc.  
18005 Adia Hwy. Lane  
Carson, CA, U.S.A. 90146  
Telephone: 12131 532 4532  
Telex: 194360

### Agency Contact:

Allan Franklin  
President  
Allan Franklin Advertising  
116 W. Del Mar Blvd.  
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Telephone: 12131 795 5787

Don Williams  
58 Alamo Journal  
3018 Howell Road  
Hixson Tennessee

## SECTOR (FLEX)

Dear Don

Enclosed please find five pages of a program and lead-in I wrote last week.

I hope you and your readers find it interesting and useful.

Yours truly,

Bill Knight  
Bill Knight

Ever wanted to see just what is on track 00? Have you ever responded "Y" to the "ARE YOU SURE?" of the file delete command, then said "OOPS"? Or have you ever had a damaged disk directory and wanted to find the track and sector numbers of the only copy of an important program?

If your answer to any of these is "YES" then SECTOR can be of use to you.

SECTOR is a utility program which allows any sector on a disk to be examined. The information is output in both hex and ASCII characters. It can be used to look at the contents of the loader and directory sectors of track 00 as well as the normal data sectors anywhere on the disk. The information gained can be used with RECOVER.CMD, a TSC FLEX utility, to recover deleted files or files on a disk with a damaged directory.

The general syntax of the SECTOR utility is:

SECTOR, (DRIVE), (TRACK), (SECTOR)

where (DRIVE) is the drive number (0-3), (TRACK) is the track number in hex (0-4C for 8" drives), and (SECTOR) is the sector number in hex (in FLEX sectors start at 1).

Before the sector is displayed, two, 2 digit numbers, are output. The first is the hex value of the track number and the second is the sector number also in hex. Each of the lines of data will contain 16

SECTOR is assembled to run as a .CMD utility in the FLEX transient area at \$A100. The byte at \$A117 is the number of tracks and is currently \$4D (77) for 8" drives. It should be changed, if necessary, to reflect the number of tracks on the drives used in the system.

I hope SECTOR proves to be an interesting and useful addition to your FLEX utilities.

```

**          NAM          SECTOR
*
* SECTOR UTILITY
*
* THIS PROGRAM ALLOWS ANY SECTOR
* ON A DISK TO BE EXAMINED.
*
*
* TO USE:
* TYPE "SECTOR,(DRIVE),(TRACK),(SECTOR)"
*
* NOTE: TRACK & SECTOR ARE
*       ENTERED IN HEX.
*
*
* WRITTEN BY BILL KNIGHT
* APRIL 4, 1980
* ALL RIGHTS RESERVED

```

• SYSTEM EQUATES

AD3C	OUTHEX	80U	SAD3C
AD46	GETHEX	EDU	SAD42
B486	FMS	80U	SB486
AD24	PCRLF	80U	SAD24
AD10	PUTCHR	80U	SAD18
AD03	WARMS	80U	SAD03
AD1F	HPTRR	80U	SAD3F
AD1E	PSTRING	80U	SAD1E

• FILE CONTROL BLOCK

A840 FCB 20U SA840

- **SECTOR UTILITY**

A100	ORG	SAL00
A100 20 04	BRA	SECT1
A102 01	VM	PCB 1
A103 00	LINE	PCB 0
A104 00 00	TEMP	PDB 0
A106 BD A1 92	SECT1	JSR HEXIN GET DRIVE 0
A109 2D 73	BLT	DRVRRR VALID DRIVE ?
A100 81 03	CMP A	13 IF NOT
A10D 2E 6F	IGT	DRVRRR REPORT
A10F 87 A8 43	STA A	PCB+3 STORE IN PCB
A112 8D 7E	BSR	HEXIN GET TRACK 0
A114 2D 6D	BLT	TRKERR VALID TRACK ?
A116 81 4D	CMP A	477 IF NOT
A118 2C 69	BGE	TRKERR REPORT
A11A 87 A8 5E	STA A	PCB+10 STORE IN PCB
A11D 8D 73	BSR	HEXIN CBT SEC OR 1
A11F 2F 67	BLE	SECTERR REPORT IF INVALID
A121 87 A8 5F	STA A	PCB+31 STORE IN PCB
A124 CE A8 40	LDX	9PCB POINT TO 9CB
A127 86 09	LDA A	19 SET FOR SINGLE
A129 A7 00	STA A	8,X SECTOR READ
A12B BD B4 06	JSR	PMS GO DO READ
A12E 26 46	HNE	DXERR ERRORS ?
A130 BD AD 58	JSR	PCRLF OUTPUT CR & LF
A113 C8 A0 24	LDX	9PCB+30 POINT TO TRACK 4
A116 BD 66	BSR	HEXOUT OUTPUT TRACK
A119 C8 A0 5F	LDX	9PCB+31 POINT TO SECT R
A120 BD 61	BSR	HEXOUT OUTPUT SECTOR
A130 BD AD 24	JSR	PCRLF OUTPUT CR & LF
A140 CE A8 60	LDX	9PCB+K4 POINT TO DATA
A143 86 18	LDA A	116 SET LINE COUNT
A145 87 A1 03	STA A	LINE
A148 C6 10	SECT2	LDA B 116 SET COLUMN COUNT
A14A FF A1 04	STX	TEMP SAYE X
A14D 37	SECT3	PSH B
A14E BD 4E	BSR	HEXOUT OUTPUT DATA BYTE
A150 00	INX	BUMP TO NEXT
A151 33	PUL B	
A152 5A	DEC B	
A153 26 F8	BNE	SECT3 DEC COLUMN COUNT
A155 FE A1 04	LDX	TEMP RESTORE POINTER
A158 C6 10	LDA B	116 RESET COUNT
A15A A6 00	SECT4	LDA A 8,X GET CHARACTER
A15C 84 08	AND A	157F MASK MSB
A15E 81 1F	CMP A	151F CONTROL CHAR ?
A160 2D 02	ORI	SECT5

A162	86	5P		LDA	A	%SF	IF \$0, LOAD-US-
A164	8D	AD	SECT5	JSR		PUTCHR	OUTPUT CHARACTER
A167	08			INX			RUMP TO NEXT
A168	5A			DEC	B		DEC COLUMN COUNT
A169	26	EF		MNE		SECT4	
A16B	BD	AD	24	JSR		PCRLF	OUTPUT CR & LF
A16E	7A	A1		ORC		LINE	DEC LINE COUNT
A171	26	D5		UNE		SEC 2	FINISHED ?
A173	7E	AD	03	EXIT	JMP	WARMS	RETURN TO FLEX

## • ERROR ROUTINES

A176	CE	A1	A6	DSKERR	LOX	#ERR1	DISK ERROR
A179	BD	AD	L6	REPORT	J5R	STRNG	OUTPUT STRNG
A17C	20	F5			BRA	EXIT	EXIT
A17E	CE	A1	B6	DRVRER	LOX	#ERR2	INVALID DRIVE
A181	20	F6			BRA	REPORT	REPORT
A183	CE	A1	CB	TRKERR	LOX	#ERR3	INVALID TRACK
A186	20	F1			BRA	REPORT	REPORT
A188	CE	A1	E6	SECTOR	LOX	#ERR4	INVALID SECTOR
A18B	20	F2			BRA	REPORT	REPORT
A19D	BD	AD	3F	RCERR	J5R	#ERRR	REPORT ERROR
A19B	20	F1			BRA	EXIT	EXIT

### • HEX INPUT ROUTINE

A192	BD	AD	42	HEXIN	JSR	GETHEX	GET NUMBER
A195	25	F6			BCS	RDEHR	ERROR ?
A197	FF	A1	84		STX	TEMP	RETURN WITH
A19A	B6	A1	B5		LDA A	TEMP+1	LOW ORDER BYTE
A19D	39				RTS		IN A

#### • HEX OUTPUT ROUTINE

```

A19E BD AD 3C  HEXOUT  JSR    OUTHEX  OUTPUT IT
A1A1 06 28      LDA    A    PS20     SETUP SPACE
A1A3 7E AD 18      JMP    PUTCHR  O PUT IT

```

- ERROR STRINGS

```

A1AF 44      ERR1   FCC      'DISK READ ERROR'
A1B5 04      4
A1B6 04      ERR2   FCC      'INVALID DRIVE NUMBER'
A1CA 04      4
A1CB 04      ERR3   FCC      'INVALID TRACK NUMBER'
A1DF 04      4
A1EB 04      ERR4   FCC      'INVALID SECTOR NUMBER'
A1F5 04      4
                FCB
                4
                SECT

```

NO ERROR(S) DETECTED

## SYMBOL TABLE:

DRVERR	A17E	OSKERR	A175	ERR1	A1A6	ERR2	A1B6	ERR1	A1CB
ERR4	A1E0	EXIT	A173	FCB	A840	PMS	0406	GSFTHX	AD42
HEXIN	A192	HEXOUT	A19E	LINE	A103	OUTHEX	AD3C	PCRLP	AD24
PSTRIN	AD1E	PUTCHR	AD18	RDERR	A1B0	REPORT	A179	RPTERR	AD3F
NEXT	A100	SECT1	A106	SMT2	A148	SECT3	A140	SECT4	A15A
SECT5	A144	SECTER	A188	TMP	A104	TRKERR	A103	VN	A1E2

CER-COMP  
5566 Ricochet Ave.  
Las Vegas, Nevada 89110  
Ph# 702-452-0632

APR 11 1980

## NEW PRODUCTS RELEASE

Car-Corp is pleased to announce the release of some new software products for the LFD-400 (4) user. As you may know Car-Corp has been writing programs for this disk esiste for over 2 years now and does not intend to let the LFD-400 user become lost in this new era of the 6200. We are now making available for a most reasonable cost a 6800-8500 assembler. This assembler is written in 6800 assembly language. The assembler set with all of it's addressing modes and cross assemble exciting 6800 assembler source code. It will output object code directly to memory, disk or tape and will support either a serial or parallel printer for source listings which can be specified at the time of assembly. This is now available for use with Minidisk (4), Minidoc (4) and MinidocPlusx (4) (4).

The second new addition is a 6809 version of Minidos (\*) which will run under the PSYMON (+) 6809 monitor. Other monitors can be used if requested but this seems to be the most intensive and readily available monitor at this time. This new basic disk driver first does disk rotation and can do direct access basic reference to the disk header. It can also read after write byte for byte compare including the disk header to reduce errors to an absolute minimum. The use of the direct read register allows the disk header to be located on any page of memory which also allows the construction of multiple disk headers. This is available on either a 2708 EPROM or Disk and can be run directly out of ram at any location without reassembly. All major entry points are maintained for compatibility with Minidos (+) to make source conversion a little easier.

### Prices

PROB99 (a)	6800-6809 cross assembler (Minidisk-I)	\$30.00
PROB99 (u)	" " " (Minidis)	\$35.00
PROB99 (e)	" " " (MinidisPlusX)	\$35.00
MINDOS99 (e)	6809 Minidos replacement on Disk	\$14.95
MINDOS99 (e)	" " " on 2708 EPROM	\$19.95
PROB99 (e)	and Minidisk+ ELITOR for Minidisk on Disk	\$45.00

write or call for other combination prices

(e) Minidisk, MinidiskPlusX, LFD-400 and Fsyron are trade marks of Percon  
(e) Minidisk+, Cross9 and Minidisk09 are trade marks of Csr-Cohr.

## BEAT THE "6809" UPGRADE BLUES

When I first started seeing the new 6809 Processor Boards show up on the market I said to myself it's just too expensive to buy a new processor board costing anywhere from \$150 on up, so I'll just sit back and wait. Then word got around that Percom came out with their 6809 upgrade kit for \$69, great! This is just what the doctor ordered, and so I did. When it finally arrived I hand-entered (being a cheap hobbyist at heart) the "SGNODN" monitor listing that was provided with the kit, burned a 2708 PROM for my SWTP MP-A2 processor board and put it all together. Powered up the system, got the prompt on my terminal and just then I realized that I didn't have a single program that would run on my "NEW" 6809 system. Every day I invested alone with all that time and effort was useless to make my new toy work for me. So I started really looking hard at the prices for 6809 software and realized there was no way I was going to buy new software at those prices. So there I was with my new toy up and running with nothing to run and my old toy sitting on the shelf with all those nifty programs. I switched back and forth for a while changing parts to go from 6800 to 6809 and vice versa; finally I bought a blank MP-A2 processor board and spent about \$30 to put enough parts on it to make my 6809 upgrade kit work. Now all I had to do was swap a board in and out still this is not like a lot of hassle and programs still had to be re-loaded every time I switched boards. After a short time I really got tired of this and decided there had to be a better way. Seeing that I had two computer systems I decided to make one of them my 6809 system. I even built a small network to communicate between systems through the console terminal interfaces at 9600 baud, that way I could use the same punch and dump routines to send and receive data easily. I even wrote a program to read disk files and convert them to Motorola EBCDIC format so my 6809 could load them without any special software running. This too seemed OK for a while but still not to be a pain because, one system had a 5 1/4 in disk drives (6800) and the other had a 5 in, Inter-Byte disk drive (6809) which I couldn't use because my 6809 wouldn't run fast enough when I wrote new driver routines. So back to the drawing board one more time. Why can't I have both processors in the same system and just flip a switch to go from one to the other and back again. That way I could assemble my new programs right in memory, flip the switch and check it out. So that's just what I decided to do.

The SWTP MP-A2 processor board was basically designed to allow another device to take control of the system "BUSES" for a DMA or Halt operation but, the clock and reset outputs from the board are still active when the Buss Available line comes up. These had to be de-activated before any other processor could take control of the Buss and the only other thing that had to be done was to selectively halt one of the processors. So here are the changes that will allow the processors to be switched on and off the Buss.

### MP-A2 Processor Board changes

Removals:	IC 11-15	to Gnd	Remove enable from 02 clock & reset
	IC 12-02	to Halt	Remove Halt line input from Buss
Connections:	IC 11-15	to 11-01	Disable 02 clock & reset when BA active
	IC 02-12		to Switch Processor Halt line to switch select
	Gnd		to Switch center pole to provide Halt signal

### MP-A (old) Processor Board

Removals:	IC 12-04	to 12-05	Enable for Data Buss transceivers
	IC 10-06	to 12-12	Enable for all other buss lines
Connections:	IC 12-01	to 12-05	Disable Data Buss with BA signal
	IC 12-02		to Switch Processor tri-state enable

Remove the Baud Rate Generator and Driver from one of the Processor boards. If an MP-A processor is being used it must contain the Baud Rate Generator and driver because it uses them to generate the processor clocks. Although it seems like the MP-A Halt line should work the same as the MP-A2 it doesn't. For some reason it just don't set it; if you look at the schematic I am directly enabling and disabling all tri-state gates directly through the switch whether the processor is halted or not.

Anyway once these changes are made all you will have to do to switch from one processor to the other is: Press and hold the Reset button. Flip the toggle switch to select the other processor and then release the Reset button. The normal monitor prompt should come up without disturbing any memory locations except the respective stacks and initialization ram.

I hope this is of some help to anyone who is thinking about making the change but doesn't want to give up what they already have in 6800 software. I know that it sure has made life a lot simpler for me.

Yours truly,

Bill Vernon  
5566 Ricochet Ave.  
Las Vegas, Nevada 89110  
Ph: 702-452-0632

### \*\*\*\*\* NEW PRODUCT ANNOUNCEMENT \*\*\*\*\*

PHILLIPS FINEWARE ANNOUNCES THE INTRODUCTION OF M-PASCAL. THIS PASCAL BASED LANGUAGE HAS ALL THE FEATURES NECESSARY TO CONVENIENTLY PRODUCE WELL-STRUCTURED PROGRAMS. IT IS DESIGNED TO RUN ON A 6800 HAVING 24K OF UNUSED RAM AS WELL AS MINI-FLEX (T.W. TSC) ON SWTPC MP-68. M-PASCAL IS WELL SUITED TO APPLICATIONS IN SYSTEM SOFTWARE, PROCESS CONTROL, GAMES OR SELF EDUCATION.

#### • STATEMENTS

PROCEDURE ( SUBROUTINE DEFINITION )

VARIABLE := EXPRESSION ( ASSIGNMENT )  
IF CONDITION THEN STATEMENT ELSE STATEMENT  
WHILE CONDITION DO STATEMENT  
REPEAT STATEMENT UNTIL CONDITION  
READ (NUMBERS AND/OR TEXT)  
WRITE (NUMBERS AND/OR TEXT)  
WRITEH (NUMBERS AND/OR TEXT)  
GET (READ FROM DISK FILE)  
PUT (WRITE TO DISK FILE)  
BEGIN STATEMENT1; STATEMENT2; .., END  
NAME (SUBROUTINE INVOCATION BY NAME)

#### \* DATA TYPES AND CLASSES

INTEGER STRING ARRAYS CONSTANTS

#### \* ARITHMETIC OPERATORS

+ - \* /

#### \* CONDITIONAL OPERATORS

\* # < > >= <= AND OR

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6800/6809

## Modem Program

With Disc File Transfer

Instructions and Source Listing \$25.00

Disc with source and object, add \$10.00

Specify 6800 or 6809; 5" or 8"; modem port number (serial interface); SSB, MiniFlex, Flex 2.0 or Flex 9; SWTBUG, Smartbug, GMXBUG, or SBUG-E.

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- \*SUPER ISOLATOR (ISO-3), similar to ISO-1A except double filtering & Suppression . . . . . \$85.95
- \*ISOLATOR (ISO-4), similar to ISO-1A except unit has 6 individually filtered sockets . . . . . \$96.95
- \*ISOLATOR (ISO-5), similar to ISO-2 except unit has 3 socket banks, 9 sockets total . . . . . \$79.95
- \*CIRCUIT BREAKER, any model (add-CB) Add \$ 7.00
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SPL/M is a block-structured language which features arbitrary length identifiers and structured programming constructs. It is suitable for systems programming on small computers, since the compiler requires only 20K of memory and a disk system. SPL/M is a pure code compiler and is currently available for 6800 computer systems using either FLEX II or SSB's DOS68 51 disk operating systems. Package consists of: 3 SPL/M Library files which allow both terminal and file I/O. Most Major DOS routines are supported.

**SPL/M for FLEX II**

The SD Compiler Basic is the most well developed basic for the 6800. Some of the more notable features include: Formatted Print Statements, If Then Else & While Do, Variable Names Up To 15 Characters and High Speed Execution. Both random and sequential device I/O can be done in either binary or ASCII mode for data flow control to the byte. Now available for FLEX II, FLEX I, MINIFLEX and SSB FLEX II. Package includes: Basic compiler, Mail assembler (with extensive manuals for each), run time package and 4 misc. utilities. Call or write for detailed catalog. Dealer inquiries invited.

**6800 PRODUCTS AT A-VIDD**  
Software Dynamics Compiler Basic

Price: . . . . . \$330.00  
Software Dynamics Editor . . . . . \$100.00

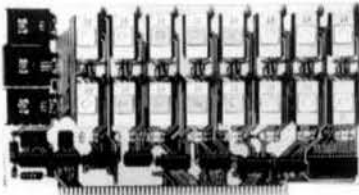
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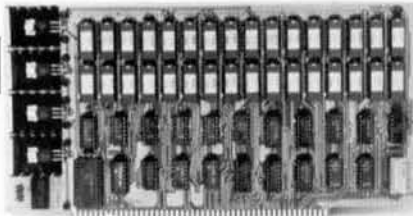
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**\$225**  
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FOR 4MHZ  
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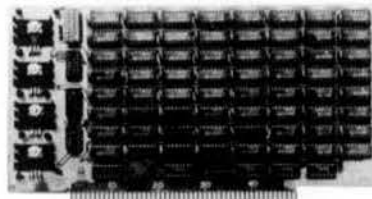
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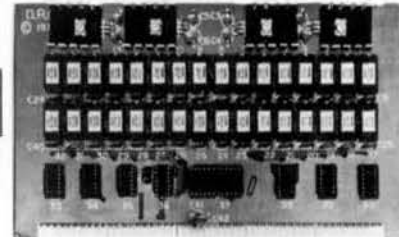
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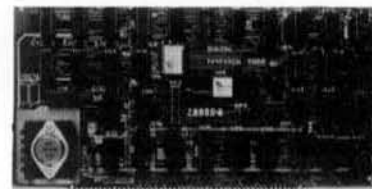
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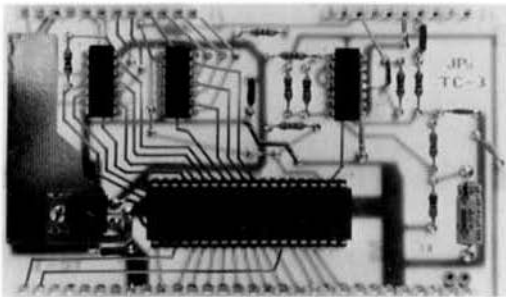
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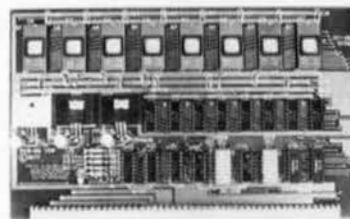
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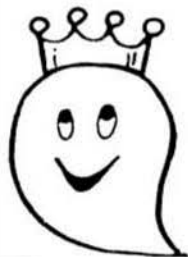
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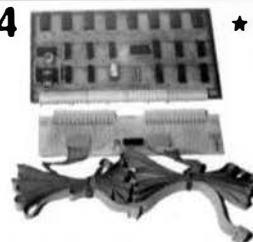
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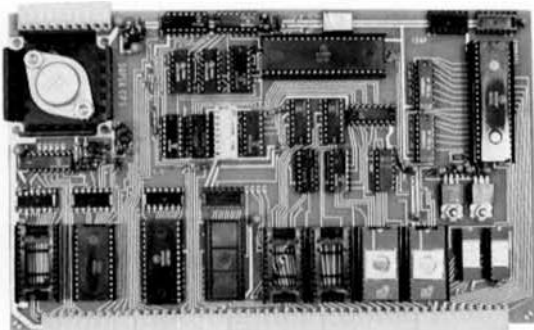
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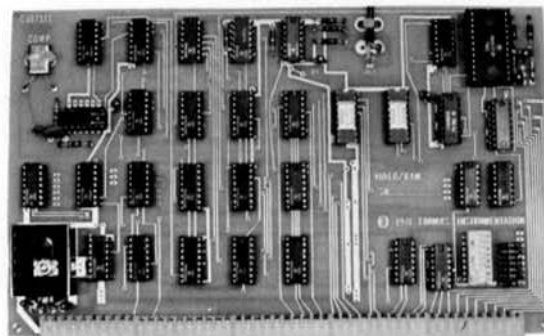
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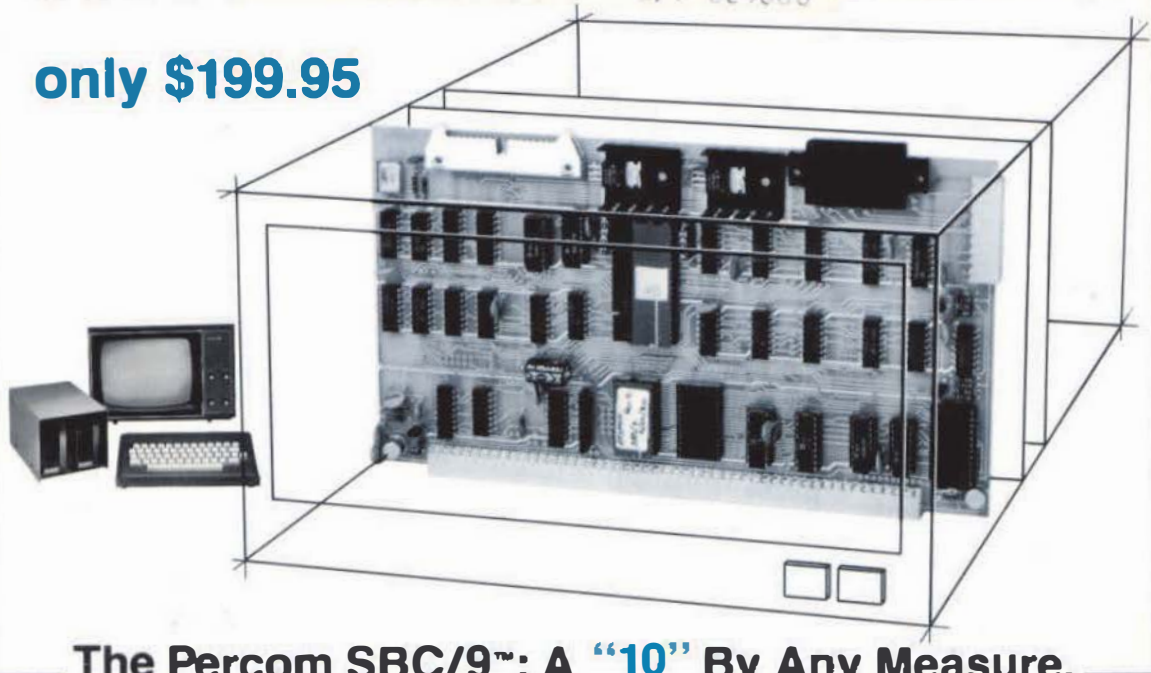
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